JUNE 10, 1996 VOLUME 13, NUMBER 24

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Annual Budget Survey shows it's back to basics. Page 47.

Novell's NT plan no longer secret

Company says it is mulling three ways to let customers' WinNT servers take advantage of core NetWare services

By Christine Burns
Boston

Putting an end to rumor and speculation Novell, Inc. CEO Bob Frankenberg last week vowed publicly that his company will tie its Novell Directory Services (NDS) to Microsoft Corp.'s Windows NT Server by year-end.

NetWare and NT Server users alike have been asking for NDS support since NT Server began making inroads as an application server for NetWare LANs. Currently, it is difficult for users with mixed networks to locate information on NT Servers using NetWare administrative tools.

Many reports have surfaced about NDS NT support. However, at a gathering of the Boston Novell Users Group last week, Frankenberg said Novell will

See Novell, page 67



Microsoft SNA bluer than IBM

SNA Server 3.0 to support more users, advanced features

By Michael Cooney
Redmond, Wash.

Microsoft Corp. next week will introduce a more powerful version of its SNA gateway software that will enable NT users to build more efficient networks while

stopping rival gateway vendors in their tracks.

According to Microsoft documents obtained by Network World, SNA Server 3.0 will support twice as many users as the current version. And it adds improved TCP/IP and SNA application-sharing capabilities, meaning customers could deploy fewer but more functional gateways. The announcement is a big boost for Microsoft in its efforts to improve its image as a serious player in the enterprise connectivity arena.

Microsoft officials could not be reached by press time.

The announcement is also a direct shot at IBM and Novell, Inc. The two companies have been working together on the NetWare for SAA gateway since last October, but no significant new features have been

See Microsoft, page 69

Intranet whirlwind whips up change



Feel something tugging at your shirt? Are the papers on your desk beginning to stir? Look out! That intranet you innocently set down across the hall is whipping up an information twister that promises to reorder your network world.

Now comes the fun part – trying to harness all that energy. *Network World* offers a helping hand with the launch of *IntraNet Magazine*. The monthly publication examines the use of private Webs to support everything from informal employee information exchange to mission-critical R&D. Each issue will feature intranet product news and reviews, technical primers, case studies and management-level articles examining the business case for intranets.

Batten down the hatches and turn to page 36.

IBM Lotus

THE IBM-IFICATION OF LOTUS

One year, $3.5 billion later...

By Barb Cole
Cambridge, Mass.

A year ago, Lotus Development Corp. exploited and customers imagined a new Lotus whose mainframes, blue suits and Lou Gerstner-engineered apparatus

The aggressive IBM chief executive officer had just launched a hostile bid for the

See Anniversary, page 68

Get more on Network World Fusion, including:

- Articles about Jim Manzi's departure
- A review of Notes Release 4
- A comparison of the replication abilities of Notes and its rivals

Select News+ then Front Page

Network World Fusion

Hook a ride on an ATM project

Follow the action along with us as Florida Power & Light girds for a statewide ATM deployment.

This is an occasional series

By Charles Bruno

Humberto Pina is practically eating, sleeping and dreaming ATM these days.

A senior telecommunications analyst with Florida Power & Light Co.'s (FPL) Telecommunications & Technology unit, Pina is swept up in a whirlwind of high-speed network activity at the utility, which is building an Asynchronous Transfer Mode network on top of its existing Synchronous Optical Network (SONET) infrastructure.



Humberto Pina (*from left*), *Neil Flynn, John Paul and Willie Thomas will be seeing FPL's ATM project to fruition.*

As the ATM point man for FPL, Pina is burning nights, days and even weekends mapping out strategy and designing the framework to ensure the ATM installation goes smoothly later this year. As he does, *Network World* will be right there with him and his colleagues. We will chronicle the roll-out in a series of articles aimed at giving you an inside look at how one company is undertaking a major ATM effort.

See ATM, page 55

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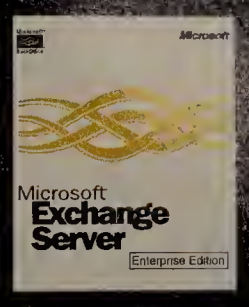
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what if
everyone in the world agreed on everything?

well, what if
millions of people agreed on something?



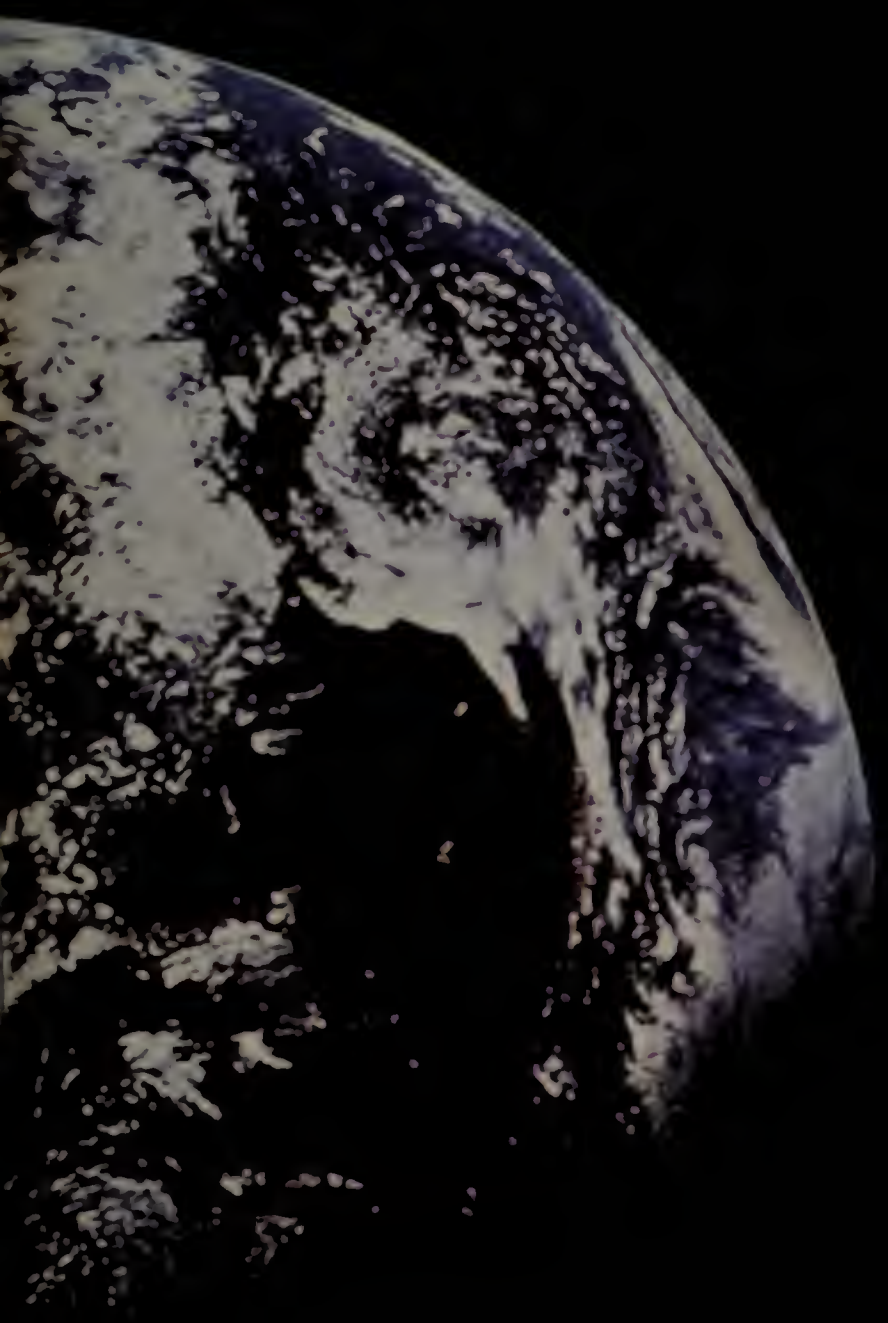
OK,
what if some of the biggest companies to deploy



It's unanimous. Microsoft® Exchange is a messaging system you can count on. Why else would major corporations across the world (along with tens of thousands of users) already be using Microsoft Exchange to support mission-critical operations? Like you, they wanted reliability. They wanted a messaging solution to meet current e-mail needs yet extend

Just some of the companies using Exchange for more than a year.

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• Labatts • Integraph • Telestra • Federated Department Stores • University of Alabama • University of Oregon



We designed a global messaging architecture two years ago. We have over 26,000 D&B associates worldwide. By deploying Exchange last year, we were able to leverage our current architecture and provide a much more scalable and robust platform to engineer our business processes.

At EDS, our goal is creating a global messaging infrastructure that improves the way our 90,000 employees do business. Exchange is the "killer app" that lets us realize this goal. It's crucial to the realization of our Internet and intranet strategy and it's come up and running with minimal effort on our global network.

Because we have so many employees on the messaging system, it has to allow us both centralized control and administration and has to appear seamless and responsive to our employees. We are deploying Microsoft Exchange Server because it delivers these capabilities.

With our domestic sales organization and headquarters on Exchange, we see Exchange as the technology backbone for supporting a collaborative approach to our sales efforts and enabling us to put regional sales directories in closer contact with headquarters.

Microsoft Exchange agreed on one thing?

their infrastructure to embrace groupware and the Internet. The prevailing opinion? Microsoft Exchange. You can quote them on it. To learn how companies are using Microsoft Exchange today, call (800) 426-9400, Dept. A492, for a copy of the Microsoft Information CD.

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This Week

News +

Do you know what happened today in networking? Click on NetFlash – your daily networking news report, updated weekdays at 1.30 p.m. EST.

The Front Page

ATM: Read more about building ATM nets atop SONET and see how Atlanta is building an ATM net to coordinate the Olympics this summer.

SNA: Download an SNA primer and an article that looks at Microsoft's effort to move into the market served by IBM's AS/400 line.

NetWare: Read up on how Novell is moving its directory services to the Internet and take a look at the new Lightweight Directory Access Protocol.

The Technical Sections

High-speed Internet: Take a look at IP routing and switching, in WANs & Internetworking.

Distributed objects: Download a primer on the subject, then peruse a draft for OLE/CORBA interoperability in Client/Server Applications.

Web sites: Read up on online copyright issues, on Intranets & the 'Net.

Forum

Where do you see ATM heading? Discuss it with our panel of experts, in our Taking Aim at ATM conference.

This week's pick

Gerd Aschemann has put together a comprehensive index of links related to network, systems and application management, from conference calendars and software to standards and books. You can reach the site at http://www.inform atuk.thdarmstadt.de/VS/Forschung/Management/ overview.html.

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HOT TOPIC

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Select Forum then Managing Enterprise Nets.

NetworkWorld

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Contents

News

6 **Microsoft pumps** security technology into its software

6 **After nine years, Microsoft** delivers Visual Basic to application masses

8 **IBM, MobileWare and Motorola** streamline Web traffic

8 **AS/400 gets** Internet and Notes features

13 **Madge makes aggressive entry** into stackable Ethernet switch mart

13 **Stratus struts** into multimode PC server clustering market

15 **HP hit with $100 million lawsuit** over management software

15 **NET makes** a frame relay move

67 **Encryption policy** has government, industry at odds

69 **Federal Trade Commission debates** European privacy policy

WANs & Internetworking

17 **Ascend's pending acquisition** of NetStar may neutralize Cisco's position in the market

17 **Anacapa details** SNA and TCP/IP response times

17 **Bay drives home** security message

Carrier Services

25 **EMI lets** frame users monitor nets

25 **ATMNet to offer** secure ATM nets nationally

Local Networks

27 **Industry consolidation** continues as Cabletron grabs ZeitNet and Adaptec snares Cogent

27 **Digital blends** OpenVMS and Windows NT

Client/Server Applications

31 **A beta user puts** Expersoft's object request broker to the test

31 **NeoVista to help customers** strike it rich with data mining tools

— Groupware

Vendors are working on interoperability but have a ways to go See page 33

Intranets & the 'Net

37 **Java reaches** for corporate brassring

37 **Maximized designs** module to thwart Web pirates

Technology Update

41 **RMON2 delivers** net- and application-layer stats

Management Strategies

56 **Remote access service providers** help network managers drive down costs

Opinions

18 **Scott Bradner** discusses two main points of Harvard conference on the Internet and society

29 **Dave Kearns** tracks the progress of Java-enabled LANs

30 **Skip MacAskill and Melinda Le Baron** dissect the ways companies are converging

32 **Daniel Blum** says LDAP will provide essential glue for E-mail and network operating systems

44 **Editorial:** Hands off? Or on?

44 **Mary Johnston Turner** outlines changes to come as carriers try to keep up with demand

70 **Dave Buerger:** Xerox may have something with new document vision

70 **Mark Gibbs:** The almighty ROI (which turns out to be talked about more than practiced)



Apple's Umeki continues to shake things up. Page 28

Features

Network World Budget Survey: *It's back to basics when it comes to where the big bucks go.* Page 47.



WORLD CLASS

Review: *OS/2 Warp Server is first to earn our new World Class award.* Page 71

Network Help Desk. Page 41

Message queue. Letters to the editor. Page 45

Editorial and advertiser indexes. Page 60

NetworkWorld's Mission. To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.

News briefs, June 10, 1996

Microsoft to go with 64-bit Cairo


Microsoft's *Maritz*

Microsoft Corp. plans to develop a 64-bit version of the next rendition of its Windows NT operating system, code-named Cairo, a company official said during a keynote speech at Comdex/Spring '96 in Chicago last week. Microsoft will initially implement the software on Digital Equipment Corp.'s Alpha microprocessor, said Paul Maritz, group vice president of Microsoft's platforms group. The capability is especially relevant to organizations such as credit-card processing firms and airline reservation handlers that are operating very large databases, Maritz said.

Novell customers wise up about messaging

Novell, Inc. last week announced that about 100 sites have begun beta-testing its GroupWise 5 messaging and groupware software, which previously was known as GroupWise XTD. This beta is the first to include advanced document management features, according to Novell. Another round of beta tests focusing on performance improvements will begin next month, and the product is scheduled to ship shortly thereafter.

A look into I2O's future

Officials from the I2O Special Interest Group unveiled a road map for their I/O device driver specification at Comdex/Spring '96 in Chicago last week. Carlton Amdahl, an independent consultant for the I2O effort, said Version 1.5 of I2O, which features messaging technologies for peer-to-peer connections, RAID configurations and tape storage, will be completed by year-end. Version 2.0, due out sometime in 1997, will address communications within clustered systems and systems management.

More show coverage, page 8.

Dell says sell, sell, sell

Dell Computer Corp. last week announced price cuts of up to 20% on its servers in conjunction with a Windows NT promotion that gives customers an installed copy of Version 3.51 free with each server purchase. A month earlier, Dell cut prices on some servers up to 34%. Dell officials said a reduction in component part costs was the main reason for this latest round of cuts.

CDPD prices plummeting

Bell Atlantic NYNEX Mobile (BANM) last week unveiled a revised pricing structure for its AirBridge Cellular Digital Packet Data (CDPD) service that the company said reduces usage charges by more than 70%. Pricing packages carry minimum usage charges of $14.95, $54.95 and $89.95 per month. Fees range from 4 cents per kilobyte for the high-end plan to 15 cents per kilobyte for the low-end plan. There is no recurring flat monthly service fee. CDPD prices began to fall drastically in January, when GTE Mobilnet, Inc. slashed prices by nearly 60% to reach rates that BANM now almost mirrors.

Symantec readies product blowout

Symantec Corp. of Cupertino, Calif., will roll out a series of products at PC Expo next week, including the Norton Administrator Suite — Premiere Edition — and PCAnywhere32 7.5. The suite is targeted at networks with more than 1,000 nodes and features hardware and software inventory, virus protection, software metering and distribution, remote control and configuration management utilities. PCAnywhere32 7.5 is a desktop utility for remote access that now has gained Internet and ISDN capabilities.

3Com to make an Impact in ISDN

3Com Corp. later this month will debut an ISDN modem, dubbed ImpactIQ, that will provide customers with high-speed access to the Internet. ImpactIQ will offer stack compression, autoswitch detection and Windows 95 support. Pricing has not yet been set.

Microsoft breaks crypto barrier

By Christine Burns and Ellen Messmer
Redmond, Wash.

Microsoft Corp. last week said it will include cryptography-based security technology in its operating systems, messaging product and Web browser through a new set of APIs that will be available both in the U.S. and overseas.

The fact that the National Security Agency is allowing Microsoft to export the cryptographic APIs is somewhat of a coup for the software vendor, although the NSA did nothing to alter the current export ban on strong encryption.

NSA approval of the Microsoft technology could also be a boon to customers, many of which now find it difficult to deploy a consistent and secure set of applications here and abroad because of strict controls on encryption technology.

The NSA prohibits mass-market export of strong encryption and controls export of software with hooks into which any software or hardware crypto-engine could be plugged.

Microsoft's Crypto APIs will be available to third-party vendors writing applications with embedded security. But the hardware or software Crypto-engines for these applications will need to be digitally signed by Microsoft before they will work with the APIs. Under an unusual arrangement with the NSA, Microsoft will act as a front man for the powerful U.S. spy agency, checking on whether the vendors' products comply with U.S. export rules.

"I may not have a full and abiding trust in Bill Gates' goodwill, but I certainly trust him more than I trust the NSA," said Josh Turiel.

The NSA has approved Microsoft's Windows NT 4.0, Windows 95 and Explorer 3.0 browser with Crypto APIs for mass-market export. And by putting the cryptographic APIs in its operating system, Microsoft has taken the lead in setting a standard for building security into applications.

Josh Turiel, manager of information systems at Norwood, Mass.-based adlife Co., Inc. welcomed Microsoft's effort to set a security standard. "I may not have a full and abiding trust in Bill Gates' goodwill, but I certainly trust him more than I trust the NSA," he said.

But the technical director of one large company who asked for anonymity said he was troubled by Microsoft controlling security standards with the blessing of the NSA as it might crush better, competing security methodologies.

Tom Johnston, lead product planner at Microsoft's Internet security product unit platform and tools division, said the first set of APIs within the company's Internet Security Framework includes encryption, hashing and digital signatures, and is available now. ■

Microsoft serves rivals share of Visual Basic pie

By Doug Barney

In 1987, Microsoft floated the idea of replacing the MS-DOS batch language with QuickBasic, all in the name of getting applications to work together under OS/2.

Now, nine years later, the company is finally fulfilling its promise, except that today the language is called Visual Basic for Applications (VBA), and the operating system it runs on is Windows 95.

Microsoft last week at long last announced plans to license VBA to its partners and rivals, three years after the company began adding it to its own applications.

The scripting-oriented VBA can be used to customize applications or to stitch them together. For instance, a VBA script could permit a database

See **Basic,** *page 67*

ABEND

abend *(n)* **1:** abnormal end to a computer process **2:** the online fountain of 'Net wit and high-tech humor found on Network World Fusion (www.nwfusion.com).

Top 10 networking songs we'd like to see

1. *"Don't Let the Server Break Down on Me"*
2. *"Looking for Hubs in All the Wrong Places"*
3. *"Stand by Your LAN"*
4. *"(My IS Manager Told Me) You Better Shop Around"*
5. *Theme to "Mission:Critical"*
6. *"You Don't Send Me E-mail Anymore"*
7. *"Send in the Routers"*
8. *"If I Could Save Time on AOL"*
9. *"Back on the Daisy Chain Gang"*
10. *"You Don't Mess Around With ATM"*

By Sandy Gittlen

Tune in to Network World Fusion for more of our top 10 lists. Select NetRef then Abend.

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IBI Cactus tool set hooks up to Web

By John Cox
New York

Information Builders, Inc. this week will introduce a development tool set called Cactus that is designed to solve the prickly problem of providing Web users with better access to corporate data.

Like other high-end tools, Cactus combines a development repository, fourth-generation language, graphical tools and middleware. But it also can automatically generate all the necessary HTML and communications code needed to let Web browsers access existing corporate data and applications, said Michael Howard, vice president of IBI's Cactus division.

Just as important, applications built with Cactus will maintain the link between the browser and the target database, an essential feature for interactive business applications over the Web.

Magee Womens Hospital in Pittsburgh specializes in helping women through risky pregnancies.

Last fall, the MIS group began using a Cactus beta release to rework an aging ultrasound analysis application into a true distributed one.

The new application is now about to be deployed, and the hospital plans to use Cactus' Web features to extend the application to hospitals and doctors' offices far beyond the Pittsburgh city limits, according to James Wells, Magee vice president and chief information officer.

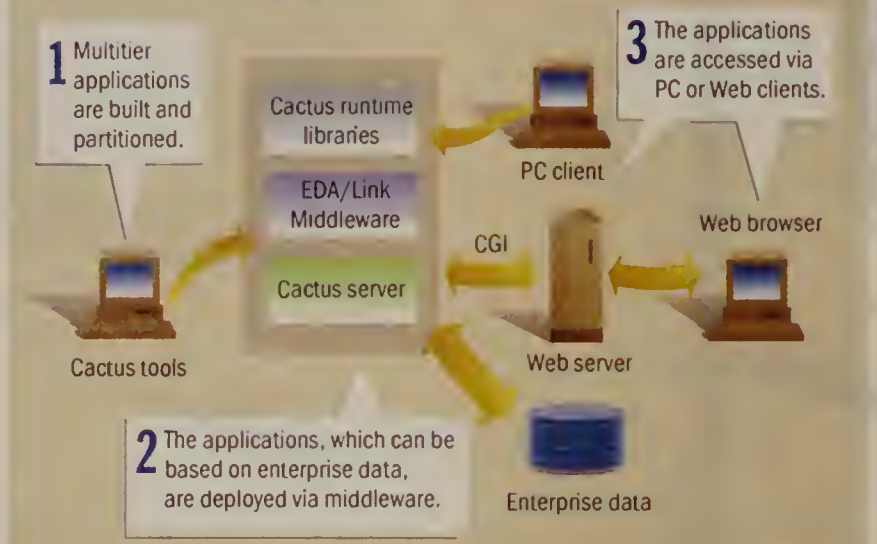
"They can do ultrasound scans, then we can grab the images and data and bring them back here [into the Cactus-based application] for analysis and consultation," he said.

Off-site doctors will then be able to view the results via a Web browser.

Cactus will be available next month for $3,250 per developer, running on all Windows operating systems and OS/2 Warp. The run-time environment is free. The server component, for Windows NT, Unix and IBM MVS and VM/CMS, ranges from $5,500 to $100,000, depending on the platform and number of users.

& IBI: (212) 738-4433.

IBI's Cactus development environment flowers



Mid-range connectivity

IBM says AS/400 gets Internet, Notes features

By Michael Cooney
Chicago

IBM wants to make its Application System/400 a server for all seasons, and is backing that drive with a variety of new communications features.

At Comdex/Spring '96 here last week, IBM announced new Internet connectivity, Lotus Notes capabilities and improved support for Windows — all this in an effort to make it easier for users to deploy the box in enterprise client/server environments.

The new features center on the AS/400's operating system, OS/400 Version 3 Release 2. For example, the Internet Connection for AS/400 transforms AS/400 into a Web server, and the AS/400 Lotus Notes feature lets workgroup users communicate and collaborate on business projects.

Lotus Notes will reside under OS/2 on the AS/400's Integrated PC Server, also known as the File Server I/O Processor (FSIOP).

"With this announcement, 400,000 AS/400 systems are transformed into Web servers and more than 28,000 applications can be Internet-enabled," said Gary Cohen, vice president of marketing and sales for IBM's Internet Division.

OS/400 will now also support the TCP/IP SLIP, which provides native TCP/IP connectivity to the Internet over inexpensive telephone lines rather than via LAN-attached routers and gateway servers. In addition, the operating system supports the Internet Post Office Protocol 3, letting the box deliver electronic correspondence to OS/2, Unix, Windows and Macintosh clients.

OS/400 3.2 will be available this month. Pricing was not available.

IBM used the Comdex show to unveil a variety of other products including:

■ An AS/400 Wireless LAN Token Ring Access Point product equipped with a 2.4-GHz radio to allow wireless communications between Token Ring devices on AS/400-based nets.

■ The 8235 Dial in Access to LANs, a remote access product for Token Ring and Ethernet LAN users. The 8232 Ethernet and Token Ring models come with two ports each and can handle more than 100 simultaneous calls from remote dial-in users.

Both models will be available this month with prices starting at $1,899.

■ An agreement between IBM, Apple Computer, Inc. and Andrew Corp. to codevelop products to integrate Macintosh clients into AS/400 networks.

■ A promotional program that could save users more than $1,000 when buying bundled OS/2 and Lotus Notes packages. For example, if customers buy Lotus Notes 4.1 with OS/2 Warp Server, they will receive 10 Notes licenses, 10 Warp Server access licenses and IBM Internet Connection Server for free. ■

Vendors' new software to streamline Web traffic

By Joanie Wexler
Chicago

Software that saves Web surfers time and money by reducing the volume of data that crosses wide-area links was a big theme here at Comdex/Spring '96 last week.

IBM, MobileWare Corp. and Motorola, Inc. all revealed product plans that use caching, compression and other technologies to help users manage the amount of Web traffic that traverses bandwidth-challenged dial-up and wireless connections.

For example, in the expensive world of wireless networking, where users often pay by the packet, eliminating unnecessary or redundant data can slash communications bills, said Julie Joyce, manager for IBM mobile communications products.

All three vendors' approaches cache portions of intranet or Internet Web pages on client devices. Users can determine how often local data should be compared with actual data on remote Web pages.

MobileWare adds agent technology to further simplify updating. With WebMirror, announced last week, users subscribe to desired Web pages, and the agent checks regularly for changes and updates the PC automatically in background mode. This lets the agent manage the requests, saving the user from intervening and waiting for entire home pages to download.

The company announced two versions of WebMirror — a $29.95 client-only and a $995 client/server version — that will be available next month.

Jack Blount, MobileWare president, said the scheme enables offline browsing, whereby agents execute URL requests and cache the data, and users browse the data on a plane or in a hotel room without paying online charges.

"Web technology is going to be very important for storing data for use by mobile workers," said Dan Merriman, director of mobile and wireless communications at Giga Information Group, a consultancy in Cambridge, Mass. "Wireless links are skinny and expensive, but there is mission-critical data out there mobile users need."

He referenced those needing real estate information, inventory status and field service data as users that could take advantage of these efforts.

WebMirror will be available in July, while IBM's Wireless Web Express — a member of its ARTour wireless middleware family — and Motorola's AirWeb are entering beta this month. Those products are expected to be available late this year.

Wireless Web Express, according to Joyce, will be able to reduce interactive traffic between clients and servers by more than 90%. Pricing will probably be modeled similarly to that of ARTour — a onetime client fee and a server fee based on the number of users, she said. The software will run on OS/2 and Windows clients, and on AIX and OS/2 servers.

Motorola's AirWeb is client/server middleware for intranet/Internet browsing across ARDIS Co., RAM Mobile Data and Cellular Digital Packet Data networks. It will be tested by Air Ventures, a new unit of Motorola Wireless Data Group to be announced this week that is charged with testing wireless data products, said Chris Graves, vice president of marketing.

The Wireless Data Group has reorganized and is expanding from focusing only on wireless packet data to include digital cellular data, she said.

Logon to Network World Fusion for:
- **A look at one way to serve up less bandwidth-intensive files**
- **A description of a Digital wireless Web client**

Select News+ then Intranets & the 'Net

http://www.nwfusion.com

AirWeb will run on Windows NT servers and on Windows 95 laptop clients, Graves said.

IBM also formed a new business unit, which it announced at Comdex, called IBM Mobile & Wireless Systems. IBM will resell IBM-branded ruggedized handhelds from partners Telxon Corp., Norand Corp. and Melard Corp. IBM will integrate its wide-area radio modems into those devices, which currently sport LAN connections only. The Telxon device will ship under the IBM name next month, and the other devices will ship throughout the summer. ■

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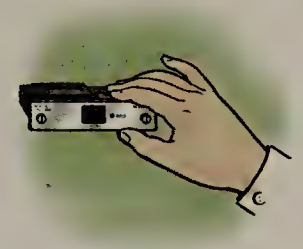
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IT NEEDS TO BE EASY TO INSTALL, MUCH SIMPLER THAN FIBER OR REPEATER OPTIONS. WITH EVERY SOLUTION I LOOKED AT—WIRELESS, MICROWAVE, STANDALONE ROUTERS, WHATEVER—THERE WERE PROBLEMS...QUESTIONABLE PERFORMANCE...DISTANCE LIMITATIONS...EXORBITANT COSTS. LUCKY FOR ME, I KNEW ABOUT **HDSL**, OR WHAT



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The ProLiant 5000, with its Pentium® Pro technology, delivers unprecedented performance for mid-range solutions.

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System	tpmC	$ per tpmC
ProLiant 5000 6/166 M2	5676.93	$135
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SPARC center 2000E	5124.21	$323
HP 9000 Model K420	4939.11	$232
IBM RS/6000 J30	3631	$289

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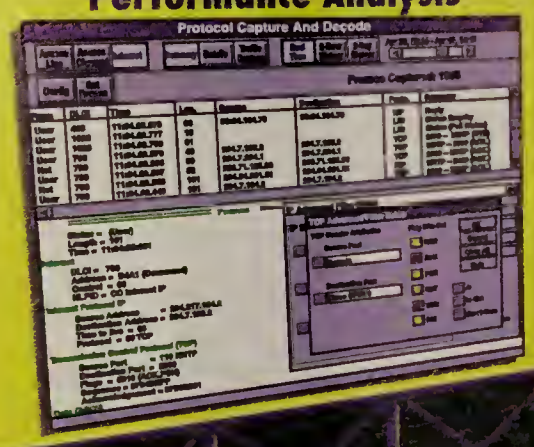
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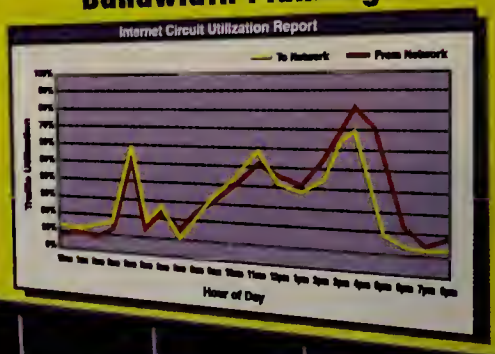
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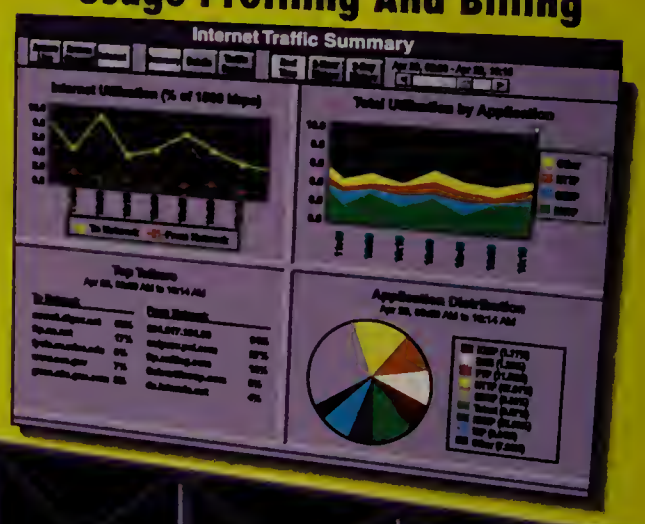
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THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Fedcral/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*_____

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*_____

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

A	B	
❑	❑	**100 LOCAL-AREA NETWORKS**
☐	☐	01. Local-Area Networks
☐	☐	02. Network Op. Sys. Software
☐	☐	03. LAN Storage/Backup
☐	☐	04. Optical LAN Storage/Backup
☐	☐	05. Disk LAN Storage/Backup
☐	☐	06. Tape LAN Storage/Backup
☐	☐	07. RAID LAN Storage/Backup
☐	☐	08. Network Test/Diagnostic Tools
☐	☐	09. Cables, Connectors, Baluns
☐	☐	10. UPS
☐	☐	11. Network Interface Cards
☐	☐	12. Peer-to-Peer LANs
☐	☐	13. SNMP Network Management
☐	☐	14. ATM Switches
☐	☐	15. Token-Ring Switches
☐	☐	16. Ethernet Switches
☐	☐	17. Remote LAN Access/Communications Servers
☐	☐	18. Superservers
☐	☐	19. File/Application Servers
☐	☐	20. Print Servers/Fax Servers
☐	☐	21. CD-ROM Servers
☐	☐	22. LAN Servers
❑	❑	**101 INTERNETWORKING**
☐	☐	23. Bridges
☐	☐	24. Routers
☐	☐	25. Bridge/Router
☐	☐	26. Gateways
☐	☐	27. Intelligent Hubs
☐	☐	28. Stackable Hubs
❑	❑	**102 COMPUTERS/PERIPHERALS**
☐	☐	29. Laptops/Notebooks/Sub-Notebooks
☐	☐	30. Micros/PCs
☐	☐	31. Minis
☐	☐	32. Mainframes
☐	☐	33. Workstations
☐	☐	34. Terminals
☐	☐	35. Printers/Network Printers
☐	☐	36. Cluster Controllers
☐	☐	37. CD-ROM
☐	☐	38. Fax/Modem Boards
❑	❑	**103 REMOTE/WIRELESS COMPUTING**
☐	☐	39. PDAs
☐	☐	40. PCMCIA Devices
☐	☐	41. Wireless Data Services
☐	☐	42. Wireless Data Equipment
☐	☐	43. Wireless LANs
☐	☐	44. Cellular Equipment & Services
❑	❑	**104 INTERNET/INTRANET**
☐	☐	45. Internet Access Service
☐	☐	46. Firewalls/Security
☐	☐	47. Web Servers
☐	☐	48. Web Browsers
☐	☐	49. Intranet Applications/Groupware
☐	☐	50. Search Retrieval Products (web crawler)
☐	☐	51. Internet Development Tools
☐	☐	52. Internet Commerce Tools
❑	❑	**105 SOFTWARE/APPLICATIONS**
☐	☐	53. Network Management
☐	☐	54. Systems Management
☐	☐	55. Security
☐	☐	56. Communications Software
☐	☐	57. Terminal Emulation
☐	☐	58. Word Processing
☐	☐	59. Operating Systems
☐	☐	60. Client/Server Applications Development
☐	☐	61. Database Management/RDBMS
☐	☐	62. Spreadsheet
☐	☐	63. Groupware
☐	☐	64. EDI
☐	☐	65. E-mail
☐	☐	66. Windows/Graphical User Interface
☐	☐	67. Multimedia
☐	☐	68. Graphics/DTP
☐	☐	69. Remote Access
☐	☐	70. Imaging
☐	☐	71. Server Suites (Backoffice, etc.)
☐	☐	72. Suites
☐	☐	73. Middleware
☐	☐	74. Document Management
☐	☐	75. Database Server
☐	☐	76. Site Metering Tools
☐	☐	77. Computer-Integrated Telephony (CIT)
❑	❑	**106 WIDE-AREA NETWORK EQUIPMENT & SERVICES**
☐	☐	78. Frame Relay Equip./Services
☐	☐	79. Modems
☐	☐	80. FT-1/T-1/T-3 Multiplexers
☐	☐	81. FT-1/T-1/T-3 Services
☐	☐	82. SONET
☐	☐	83. Inverse Multiplexers
☐	☐	84. SMDS
☐	☐	85. Asynchronous Transfer Mode
☐	☐	86. Diagnostic/Test Equipment
☐	☐	87. DSU/CSU
☐	☐	88. VSAT/Satellite
☐	☐	89. ISDN Equipment & Services
☐	☐	90. PBXs
☐	☐	91. Voice Mail/Response
☐	☐	92. Videoconferencing
☐	☐	93. Leased Lines
☐	☐	94. Switched Data
☐	☐	95. E-mail
☐	☐	96. 800/900/MTS Services
☐	☐	97. Virtual Networks
☐	☐	98. Outsourcing/Systems Integration Services
☐	☐	99. Education/Training Services
❑	❑	**107** None of the above (1-99)

BI0696

6 What is the total number of LANs, workstations/nodes at this location/ in your organization?

At this location: LANs		Workstations/ Nodes	Entire organization: LANs		Workstations/ Nodes
1.	☐ 5,000+	☐	1.	☐ 5,000+	☐
2.	☐ 1,000 - 4,999	☐	2.	☐ 1,000 - 4,999	☐
3.	☐ 100 - 999	☐	3.	☐ 100 - 999	☐
4.	☐ 50 - 99	☐	4.	☐ 50 - 99	☐
5.	☐ 10 - 49	☐	5.	☐ 10 - 49	☐
6.	☐ 1 - 9	☐	6.	☐ 1 - 9	☐

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

A	B	
❑	❑	**55 NETWORK PROTOCOLS**
☐	☐	01. SNA
☐	☐	02. DECnet
☐	☐	03. TCP/IP
☐	☐	04. Novell IPX/SPX
☐	☐	05. APPC/APPN/LU 6.2
☐	☐	06. NETBIOS
☐	☐	07. AppleTalk
☐	☐	08. NFS
☐	☐	09. IPv6
☐	☐	10. SNMP/SNMPv2
☐	☐	11. Other *(please specify)*_____
❑	❑	**56 NETWORK OPERATING SYSTEM**
☐	☐	12. Microsoft (LAN Manager)
☐	☐	13. Novell (NetWare 2.X, 3.X)
☐	☐	14. Novell (NetWare 4.X)
☐	☐	15. Windows NT
☐	☐	16. Windows NT/Advanced Server
☐	☐	17. LocalTalk (AppleTalk)
☐	☐	18. Banyan (VINES)
☐	☐	19. IBM (LAN Server)
☐	☐	20. IBM (PC LAN Program)
☐	☐	21. Artisoft (LANtastic)
☐	☐	22. Digital (Pathworks)
☐	☐	23. Other *(please specify)*_____
❑	❑	**57 LAN ENVIRONMENT**
☐	☐	24. 4M Token Ring
☐	☐	25. 16M Token Ring
☐	☐	26. Ethernet
☐	☐	27. Fast Ethernet
☐	☐	28. 100vg Any LAN
☐	☐	29. FDDI
☐	☐	30. LocalTalk
☐	☐	31. 10Base-T
☐	☐	32. ATM
☐	☐	33. Other *(please specify)*_____
❑	❑	**58 COMPUTER OPERATING SYSTEM**
☐	☐	34. DOS
☐	☐	35. Unix/Xenix/AIX
☐	☐	36. OS/2
☐	☐	37. OS/2 Warp
☐	☐	38. IBM MVS
☐	☐	39. IBM VM
☐	☐	40. Digital VMS
☐	☐	41. Macintosh
☐	☐	42. Windows
☐	☐	43. Windows 95
☐	☐	44. NT
☐	☐	45. Solaris
☐	☐	46. Other *(please specify)*_____
☐	☐	47. None of the above (1-46)

8 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Please indicate your involvement in developing/implementing Internet/ Intranet Technologies: (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ Implement
5. ☐ None

10 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes A – Installed	Mainframes B – Planned		Minis C – Installed	Minis D – Planned
1. IBM	☐	☐	1. IBM	☐	☐
2. Amdahl	☐	☐	2. Digital	☐	☐
3. Cray	☐	☐	3. Tandem	☐	☐
4. Hitachi	☐	☐	4. Unisys	☐	☐
5. Unisys	☐	☐	5. AT&T GIS	☐	☐
			6. HP	☐	☐
			7. Data General	☐	☐

What is the total number of Servers/Clients installed/planned: (USE NUMBERS ONLY)

E-AT THIS LOCATION #		F-% with Internet Access
Servers		%
Clients		%

G-ENTIRE ORGANIZATION #		H-% with Internet Access
Servers		%
Clients		%

Which of the following Servers/Clients do you have installed/planned: (CHECK ALL THAT APPLY)

	I-At this location: Servers	I-At this location: Clients	J-Entire organization: Servers	J-Entire organization: Clients
01. Power PC	☐	☐	☐	☐
02. Power Mac	☐	☐	☐	☐
03. Mac Other	☐	☐	☐	☐
04. Multi Processor Servers	☐	☐	☐	☐
05. P6	☐	☐	☐	☐
06. Pentium Pro	☐	☐	☐	☐
07. Pentium	☐	☐	☐	☐
08. 486	☐	☐	☐	☐
09. 386	☐	☐	☐	☐
10. 286	☐	☐	☐	☐
11. Risc	☐	☐	☐	☐
12. Other	☐	☐	☐	☐

11 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01. ☐ $100 million or more
02. ☐ $50 million - $99.9 million
03. ☐ $25 million - $49.9 million
04. ☐ $20 million - $24.9 million
05. ☐ $10 million - $19.9 million
06. ☐ $5 million - $9.9 million
07. ☐ $1 million - $4.9 million
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $249,999 or less
11. ☐ None of the above

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 billion to $9.9 billion
3. ☐ $500 million to $999.9 million
4. ☐ $100 million to $499.9 million
5. ☐ $50 million to $99.9 million
6. ☐ $10 million to $49.9 million
7. ☐ $5 million to $9.9 million
8. ☐ $4.9 million or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:			Entire organization:		
1.	☐ Over 10,000	4. ☐ 1,000 - 2,499	1.	☐ Over 10,000	4. ☐ 1,000 - 2,499
2.	☐ 5,000 - 9,999	5. ☐ 500 - 999	2.	☐ 5,000 - 9,999	5. ☐ 500 - 999
3.	☐ 2,500 - 4,999	6. ☐ 499 or less	3.	☐ 2,500 - 4,999	6. ☐ 499 or less

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High-speed LANs

Madge stacks up new Ethernet switches against competition

By Jodi Cohen
San Jose, Calif.

Madge Networks, Inc., best known for its token-ring products, last week rounded out the Ethernet side of its product line with its first stackable Ethernet switches.

The workgroup switches, dubbed Visage, allow customers to meld switched Ethernet, Fast Ethernet and Asynchronous Transfer Mode ports in any combination within a stack. The switches are designed to sit in the wiring closet, feeding into Madge's existing LANswitch and Collage ATM switches on the backbone.

The new devices, which can be stacked up to four units high,

See **Madge,** *page 67*

VISAGE STACKABLE ETHERNET SWITCHES

Product	Description	Price	Availability
Visage 24T	24-port 10Base-T switch	$3,995	August
Visage 16200F	16-port Ethernet switch with two 100M bit/sec fiber uplinks	$4,695	November
Visage 16200T	16-port Ethernet switch with two 100M bit/sec copper uplinks	$4,195	December
Visage 16155F(R)	16-port Ethernet switch with one ATM uplink	NA	First half of 1997
Visage 800T	Eight-port 10M/100M bit/sec Ethernet switch	NA	Q1 1997
SMON agent	Management module	$1,995	August

NA = Not available

Stratus uncovers multinode PC server cluster strategy

By Ben Heskett
Marlborough, Mass.

Stratus Computer, Inc. last week introduced a server cluster capable of supporting multiple nodes running Windows NT — and which will beat most other PC server clusters out of the gate.

The rampant clustering activity by PC server vendors during the past few weeks has focused mainly on a two-node failover model in which one server backs up another. These vendor announcements have been largely tied to Microsoft Corp.'s Wolfpack technology, which will be rolled out later this year for two-server failovers and next year for multinode clustering.



D'Angelo *says 24-node option is in future.*

Stratus, however, has taken the failover concept, added a layer of middleware from its high-end fault-tolerant systems, and designed a four-node PC server cluster coupled with two storage servers. The offering, dubbed Radio Clusters, will debut this summer.

Stratus has built a $500 million business on providing fault-tolerant systems based on Hewlett-Packard Co.'s PA-RISC and Intel Corp.'s Pentium platforms.

By year-end, Stratus will offer a 24-node option for several combinations of storage and computing nodes, said Joe D'Angelo, vice president of distributed computing at Stratus.

These systems will run Windows NT, Microsoft BackOffice applications such as Exchange and Internet Information Server, and databases such as Oracle Corp.'s Parallel Server.

The Stratus clustering software, developed by the company's Isis business unit, will be compatible with Microsoft's Wolfpack extensions to Windows NT.

Analysts said Stratus has a chance to win business before some of the bigger names in PC servers, such as Compaq Computer Corp. and HP, get rolling.

Radio Clusters start at $66,000 and will be available next month.

✆Stratus: (508) 460-2000.

Law opens carriers' arms to ISDN

By Tim Greene
Los Angeles

Competitive carriers trying to break into the local loop are starting to introduce high bandwidth services over copper phone lines, sweetened with extras such as Internet access, ISDN users were told here last week.

Teleport Communications Group (TCG) is already reselling the local loop plus ISDN and other enhancements in California, and MFS Communications Company, Inc. is getting set to follow, according to participants of a joint North American ISDN Users Forum and California ISDN User Group conference.

MFS is even clearing the way to compete with higher bandwidth Asymmetric Digital Subscriber Line (ADSL) service, something major local exchange carriers — the regional Bell operating companies and GTE Corp. — do not even offer yet themselves.

Battle of the bandwidth

In the coming war for the local telephone market, it seems clear there will be a battle over the bandwidth dollar, not just for plain old telephone service.

Since California started allowing local competition in January, a month before the federal telecommunications reform law was passed, TCG has used its own switches to offer Basic Rate Interface services to business users over leased copper lines.

TCG dresses up the bare ISDN service with Centrex service, giving remote user offices private branch exchange features and a dial-up method for hooking into corporate LANs. In addition, the company is planning to push Internet access as an ISDN add-on later this year, giving it another way to lure users.

MFS has cut deals with Ameritech Corp. to buy local loops that are conditioned for ISDN and ADSL. In the case of ADSL, MFS has the chance to start on equal footing with the RBOCs because so far no one offers a commercial ADSL service.

Multiprong attack

With these moves, MFS and TCG are showing the way competitors will swarm all over the RBOCs, with offers of voice, video, data and entertainment services all rolled up in one.

MFS wants to offer ISDN bundled with services, such as Internet access, a natural fit with its recently announced acquisition of UUNET Technologies, Inc.

Beyond these value-added services, MFS also sees the chance to demonstrate a way to market ISDN and satisfy users by offering hassle-free installation — two areas where RBOCs have lagged (see story, page 15). ■

TELECOM IN TRANSITION

TELECOM ROUNDUP

Competition coming to the capitol

Members of Congress who voted in February to strip regional Bell operating companies of their monopolies may finally get an alternative to Bell Atlantic Corp. for making their own phone calls.

The Washington, D.C. City Council last week fended off furious lobbying by Bell Atlantic to pass a bill opening up the city's local telecommunications market to full competition.

Bell Atlantic had complained that potential competitors, notably AT&T and MCI Communications Corp., would cherry-pick lucrative government and business accounts and ignore the needs of low-income residential customers. Rivals countered that nearby Maryland and Virginia had already approved local telecommunications competition, leaving the capital city out of step with its own region.

Cable deal to be ammo for long-distance entry?

Speaking of interconnection agreements, Bell Atlantic last week became the first RBOC to sign an interconnection agreement with a cable TV company under the terms of the Telecommunications Act of 1996. The cable company, Jones Communications Corp., said it will offer telephone service to cable subscribers in parts of northern Virginia.

Analysts said Bell Atlantic would use the deal to help fulfill the law's requirement that RBOCs demonstrate they have a facilities-based competitor in each state before entering the long-distance business. Critics complained that an agreement with Jones was the least potentially harmful choice for Bell Atlantic, since the cable company is less well-known than AT&T and MCI and is not even the biggest cable provider in northern Virginia.

AT&T gives it away in Illinois

AT&T is seeking to drive a wedge into Ameritech Corp.'s subscriber base in Illinois by offering an eye-popping deal for short-haul long-distance calls. AT&T is offering three free months of unlimited toll calls to points within Illinois' local access and transport areas. The only requirement: Users must presubscribe to AT&T for such service, eliminating the need to dial the carrier's 10288 code to avoid having Ameritech carry the call.

Because intraLATA toll calls fall in a narrow range between nominally free local calls and ordinary interLATA long distance, the actual average cost to AT&T for such a promotion is about $15 a month, one analyst estimated.

Talkin' telecom reform

A high-powered panel at Comdex/Spring '96 last week discussed the effect of telecommunications reform on customers and carrier services. Jack Reich, president of Ameritech Corp.'s Custom Business Services, predicted the telecommunications market will grow from $680 billion today to $1 trillion in five years. This indicates that "the [market] pie will simply get bigger," rather than many players shaking out, he said. Ameritech's top priority is to gain long-distance customers within its own service area — an $8.5 billion opportunity, he said.



Champion

Rohan Champion, AT&T new services strategy vice president, said most of AT&T's $37 billion operating budget is being used to grow its network. He also had this warning for customers: "There is going to be some chaos in the marketplace." Customers should be prepared that the next five to six years will produce a "great deal of trial and error" as companies enter new markets, he said. ■

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ISDN backers spruce up SPIDs

By Tim Greene
Los Angeles

The industry last week drew a step closer toward what has seemed like a hopelessly elusive dream: making it easy to get ISDN to work.

The North American ISDN Users Forum (NIUF) reached agreements last week with the regional Bell operating companies and GTE Corp. to use a new generic form of the code known as the service profile identifier (SPID).

This identifying code, used for configuring ISDN lines, lets the central office switch know what type of customer premises equipment (CPE) is at the other end of the line. Properly entering these SPIDs has long been a bane of users. According to Adtran, Inc. 65% of technical support calls are from users having trouble entering SPIDs correctly.

The NIUF had been working on generic SPIDs and last week announced that by year-end, all the major local exchange carriers will adhere to them with each new line they sell.

Under the old approach, the SPID number was issued to the user, who then had to enter the number from the CPE. With the new generic code, the user simply enters the phone number for the line, including the area code, followed by 0101. "That's it," according to Garrett Jenkins, manager for ISDN for BellSouth Corp. and a member of the NIUF generic SPID committee.

Meanwhile, Adtran is releasing the first product with setup software that probes the line and detects the brand of switch and the SPID numbers needed for the device. Called Express XRT, it is an ISDN modem with two phone ports.

MAKE IT EASY

Simple ordering codes, designed to take the headache out of ordering ISDN, are getting snappy names that are simpler to remember. Compatibility U, for example, is now known as Easy ISDN1.

Adtran is also scheduled to ship a second device with automatic SPID detection — Express XL/XLT — which includes an Ethernet port and supports IP routing and bridging.

Cisco Systems, Inc. is also working on automatic SPID setup, and should have software to support it by the end of the year, according to Kevin Dickson, a Cisco ISDN product manager.

Express XRT is shipping now and costs $499; a version with data-only capabilities is $299. Express XL/XLT will ship this summer.

©Adtran: (800) 923-8726.

Network management

HP slapped with $100 million lawsuit

By Jim Duffy
Philadelphia

An Allentown, Pa., software developer last week named Hewlett-Packard Co. in a $100 million lawsuit alleging illegal use of technology for monitoring broadband networks.

The plaintiff, New Century Communications, is charging HP, an HP business partner and a Pennsylvania resident with "false ownership, torturous interference and misappropriation of trade secrets" stemming from New Century's development of Galaxy, a network monitoring system for cable TV and broadband networks.



New Century claims HP is incorporating Galaxy code in its recently announced Broadband Service Analyzer and Broadband Launch Pad products. Respectively, these products can be used by companies to collect multilayer performance metrics on Asynchronous Transfer Mode links and launch the graphical user interface of any vendor's network analyzer (*NW*, April 29, page 24).

"HP definitely has certain products that are identical or substantially similar to Galaxy," said Jay Spievack, an attorney for New Century.

"We're looking to enjoin any use of our trade secrets or copyrighted material," he said.

As of last Thursday, however, an HP spokeswoman declined comment because the company had not yet been served with the suit.

Other defendants include HP business partner AM Communications, Inc., a test and monitoring equipment manufacturer in Quakertown, Pa., and Sidney Fluck, a Pennsylvania resident and former president of Calan, Inc., which HP acquired in 1994.

HP is being targeted as a result of its acquisition of the manufacturer of cable TV testing equipment, which HP subsequently dissolved in 1995.

New Century had an exclusive agreement with Calan to develop Galaxy at the time HP acquired the company. The agreement stipulated that New Century had exclusive ownership rights to the software, according to the suit.

New Century alleges that Calan and Fluck cajoled HP into acquiring the company by divulging proprietary information about the Galaxy project.

Several months after the acquisition of Calan — and only two weeks before New Century was ready to distribute Galaxy to beta testers — HP asserted that it was sole owner of all software rights associated with Galaxy and ordered New Century to stop further work on the project under threat of litigation, the suit states. ■

NET offers faster, cheaper, bigger frame option

By Tim Greene
Redwood City, Calif.

Network Equipment Technologies, Inc. will announce this week it has expanded its frame relay offerings to give users more ports on existing gear at a lower price.

The FrameXpress module, a combination of hardware and software, boosts the frame relay capacity of the NET IDNX bandwidth manager and offers faster packet processing than the previous release of the IDNX frame relay card.

"This replacement card set makes it a more powerful switch at reasonable add-on prices," according to Steve Taylor, president of Distributed Networking Associates in Greensboro, N.C.

NET in a nutshell

FrameXpress 2.03 costs **$541**, including the channelized T-1 interface.

The PX-3 packet processor card costs **$14,750** for 16 ports. The T-1 card is **$5,590**.

In addition, FrameXpress supports a channelized T-1 interface, allowing the user to buy a public network service that grooms individual channels from several remote sites onto a single T-1 for delivery to a central site.

"If you have multiple logical links over a single physical link, that gives you cost advantages," Taylor said.

The real world

This fits nicely into many real-world frame relay networks where two-thirds of all connections are 56K bit/sec or slower, Taylor said. The module can support frame relay access at speeds ranging from 9.6K to 1.5K bit/sec.

That same central-site IDNX can also link over private lines to other sites, allowing the user to set up a hybrid public/private network that can take advantage of the least expensive pricing options, but still use the single unit.

The previous release of FrameXpress supported only eight frame relay ports. The new one supports 40 ports — of 24 ports from a channelized T-1 and 16 wide-area serial ports.

The bottom line

The per-port cost for the most expensive configuration of the previous FrameXpress release was $1,600, but for the new release, FRX 2.03, it is $541, including the channelized T-1 interface.

While increasing the module's capacity, NET also added a new packet processor card, the PX-3, which increases packet processing from 8,000 packet/sec to 26,000 packet/sec.

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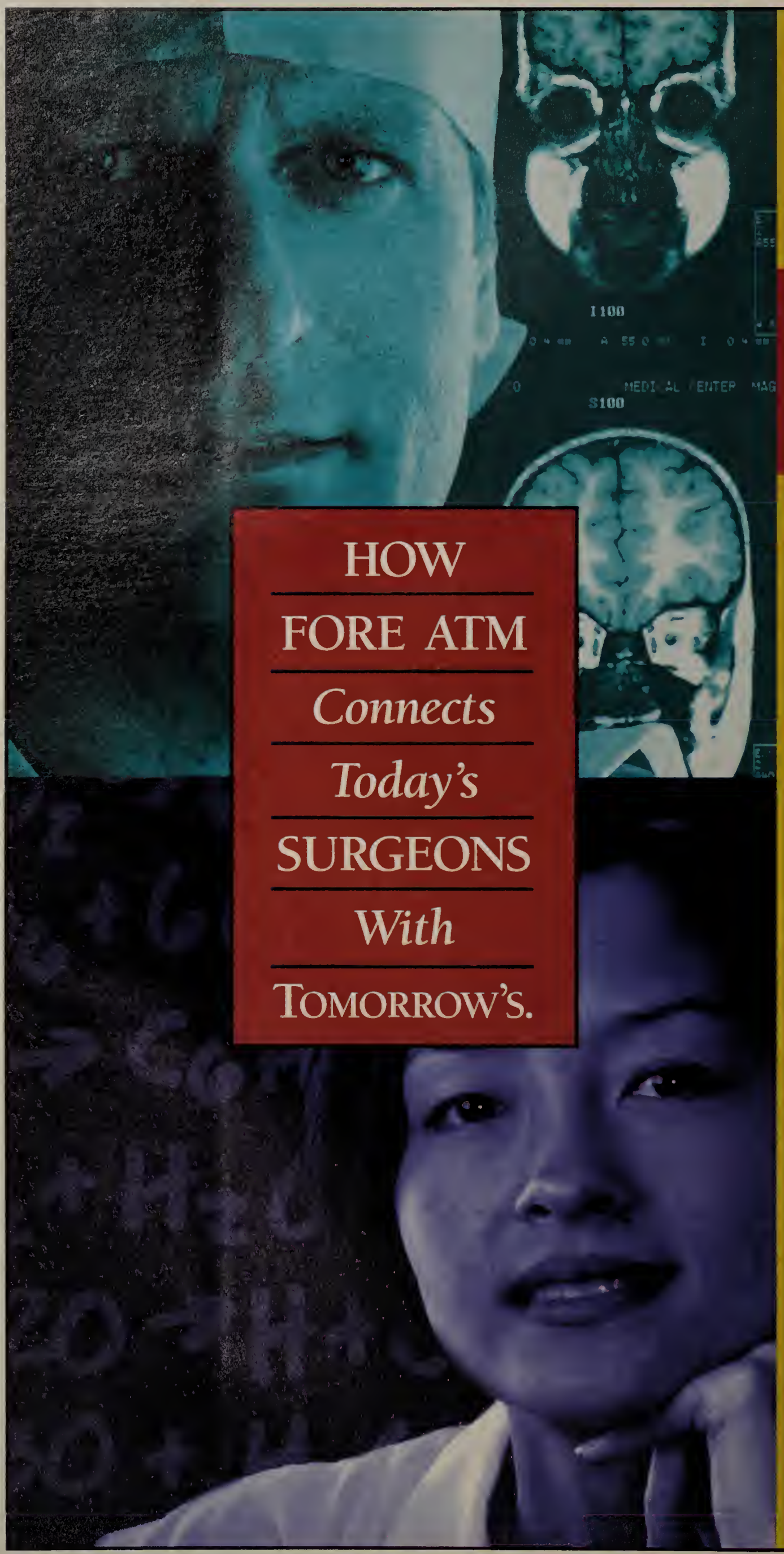
The Pipeline family – remote access solutions.

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- ISDN router with two analog ports starting at $595 M.S.R.P.
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Wes Hutchison
Vice President, Information Systems
Allegheny Health, Education and Research Foundation (AHERF)

That's Wes Hutchison of AHERF on FORE Systems. A FORE ATM network at AHERF connects medical students with surgeons in an operating room five hundred miles away. That's high resolution, full motion video. In real time.

Productivity rose almost immediately. "This is not a prototype. This is not a test. This is a production network—a strategic backbone. If the network doesn't work, there's no class and we'll have wasted the surgeons' and the students' valuable time." Real-world performance? The same network that handles video also handles complex billing data. "There's no debate here about the viability of FORE ATM. It's unusual for a technology to be cutting edge and problem-free. We implemented in one month. Just plug it in. It works."

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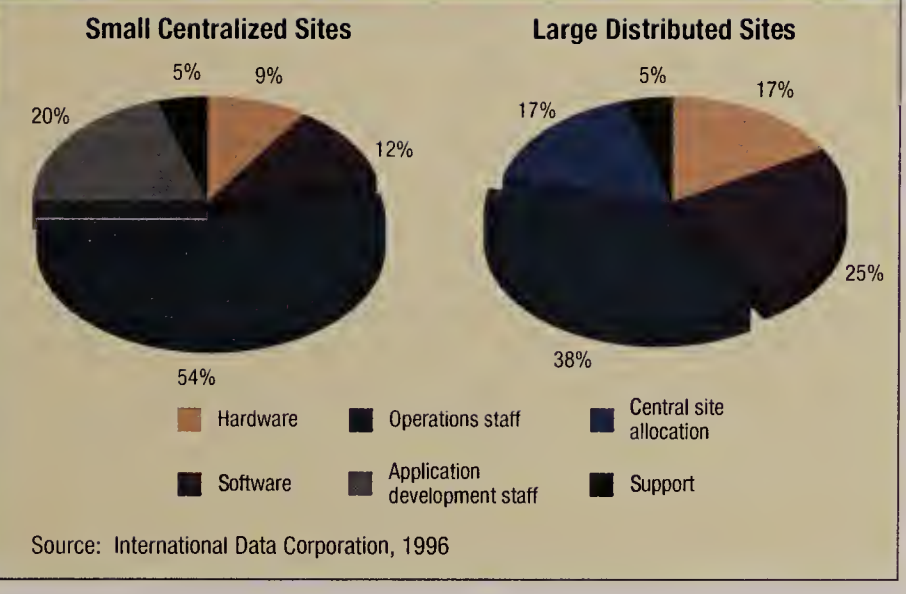
Meeting the Challenge of Client-Server Computing

Maximizing Return-on-Investment of Network Computing

The migration to client-server computing is affecting organizations both large and small almost everywhere on the planet. Computer users today have extensive access to global network-based resources, including communication gateways to other companies, individuals, and markets worldwide. Signs of this connectedness abound:

- Last year the number of LAN users worldwide hit nearly 100 million, double the number in 1993. By 1999 the number will double again
- In the same year the number of people in the world with electronic mail boxes topped 40 million. By 1999 the number will be over 125 million
- Groupware users numbered over 30 million worldwide by the end of 1995; by 1999 they will number over 250 million

Figure 1 — The Hidden Costs of Client-Server



Source: International Data Corporation, 1996

So we are heading for a wired workplace, a wired marketplace, even a wired society. However, there is a price to be paid for all this connectivity. The nearly universal implementation of client-server systems requires living with new levels of complexity and new hardware and software that people must be trained to use. Moreover, highly skilled personnel must be hired to install, manage, maintain, and administer these far-flung networks. The result is that staffing costs have become the largest contributor to total networked computing costs, regardless of the size of the installation (see Figure 1).

Until now, companies have justified the costs and complexities of client-server computing by competitive advantage–it is a very flexible and adaptable computing style. But when client-server is the norm, where will the competitive advantage lie?

IDC believes that companies that learn to manage their networked resources through technology and training will win out over their peers in the long run. Companies that understand the true costs and true benefits of client-server computing will generate quicker return for their investments. Companies that relentlessly optimize, integrate, and upgrade existing systems will stretch IT resources further and be able to reinvest sooner than competitors taking a wait-and-see approach.

Areas of Opportunity

IDC and Novell have teamed to produce this White Paper in order to help IT managers develop a strategy for maximizing return on investment in networked computing resources. It is the executive overview of three studies researched and written by IDC and sponsored by Novell. In the research it conducted,

Driving Down Networking Costs

GroupWise:

Typical annual return-per-user of 334%

Nearly $400,000 a year saved in phone costs at Farmland Foods

Courier costs cut $16,000 a year at Sheppard, Mullin, Richter & Hampton

NetWare 4:

On average 15% less expensive than NT Server from Microsoft

50% increase in users supported by a single server

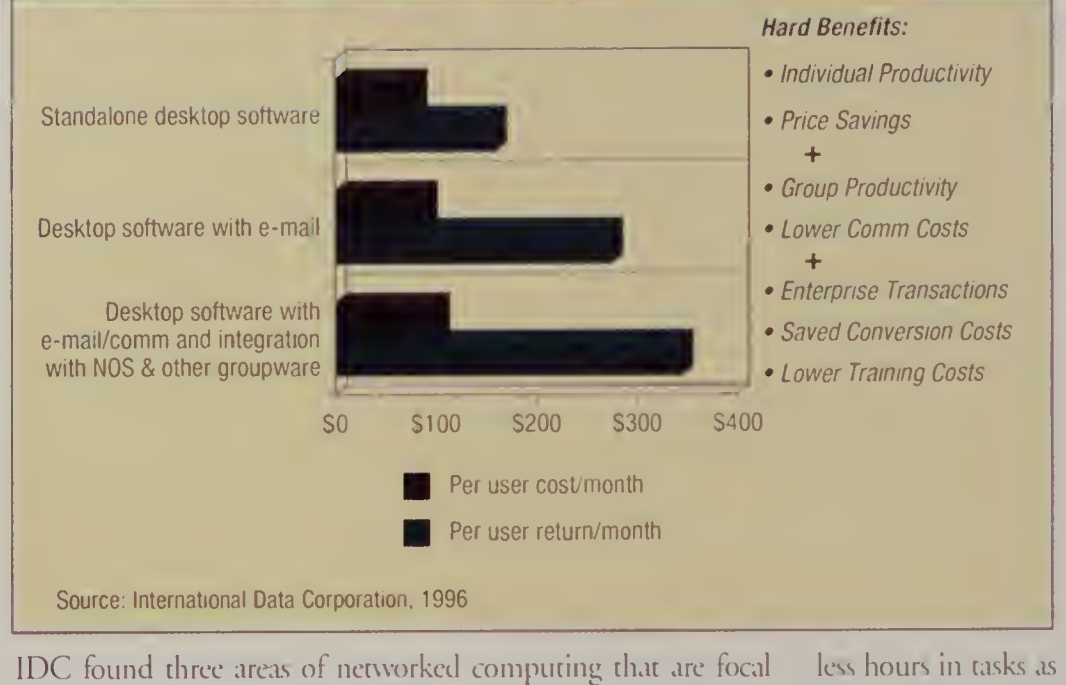
ManageWise:

$95,784 savings in business efficiency per 100 users

50% reduction in network downtime

19.7 day payback

Figure 2 — The Investment Leverage from Groupware



Source: International Data Corporation, 1996

IDC found three areas of networked computing that are focal points for ROI leverage:

1. The choice and use of communication applications such as e-mail and groupware
2. The choice and use of next-generation network operating systems
3. The use of advanced network and system management tools

In addition, IDC found that when products in support of all three of these areas work together in an integrated fashion—such as Novell's GroupWise, NetWare 4.1, and ManageWise products—benefits are compounded. Support and training costs are lower, conversions and upgrades occur faster, applications come on stream sooner, and downtime is reduced.

Applications for the Next Wave

The migration to client-server computing is a quest to provide users with access to information and computer resources beyond their desks. One of the key tools for this is groupware software, epitomized by Novell's GroupWise, software which integrates e-mail with scheduling, calendaring, and other workgroup oriented functions. The market for groupware is exploding as organizations find they can use it—specifically the e-mail function—as a platform for providing workgroup and even enterprise-wide access to information and resources.

In the research IDC conducted, almost half of the business benefits organizations received from migrating to groupware came from better internal and external communications. For instance, Farmland Foods, a $2 billion dollar meat processing company, found that since installing GroupWise, documents once faxed in 15 minutes now take less than five to e-mail. Further, the use of GroupWise saved almost $400,000 in voice phone calls a year.

Figure 2 illustrates how electronic communication and collaboration generate cascading benefits. Standalone desktop software can impact individual productivity, but when combined with e-mail, that software can improve the productivity of a whole workgroup, not just the individual user. If the e-mail is specifically designed to work with the desktop software and with the network software, as say Novell's GroupWise is with NetWare 4.1, then those workgroup benefits are compounded.

This efficiency pays real dividends. When Sheppard, Mullin, Richter & Hampton, a Los Angeles law firm, made the move to GroupWise it found the support ratio for lawyers dropped from one assistant for every two lawyers to one for every three. GroupWise scheduling cut countless hours in tasks as routine as setting up meetings; GroupWise e-mail cut courier costs by $16,000 a year.

For most companies, an investment in groupware is considered an incremental cost. The hardware is already in place, as is the network. Moreover, the support costs—which account for more than 50% of the cost of operating a networked PC—are shared across dozens of applications.

But even with all the hardware, network, and support costs amortized across the groupware software, it's a bargain. IDC's research with Novell's GroupWise customers found that a typical installation required only about $250 in fully-loaded first-year costs—less than 5% of the annual cost of operating and supporting an end-user personal computer.

For that $250 investment, those same GroupWise customers found that their first-year return was over $800 on lowered communication and clerical costs alone. Meanwhile, they accrued an array of other concrete benefits, such as fewer meetings (and thus less travel and meeting administration), easier document handling, and so on. For every single GroupWise customer interviewed by IDC, return-on-investment exceeded expectations.

Modernizing the Network

If the LAN is the heart of client-server computing, then the network operating system is its soul. As LANs have evolved from peripheral information systems to the primary components of mission-critical systems, they have become more robust and more scalable. Along the way they have also provided IS personnel with the tools to manage network resources as never before.

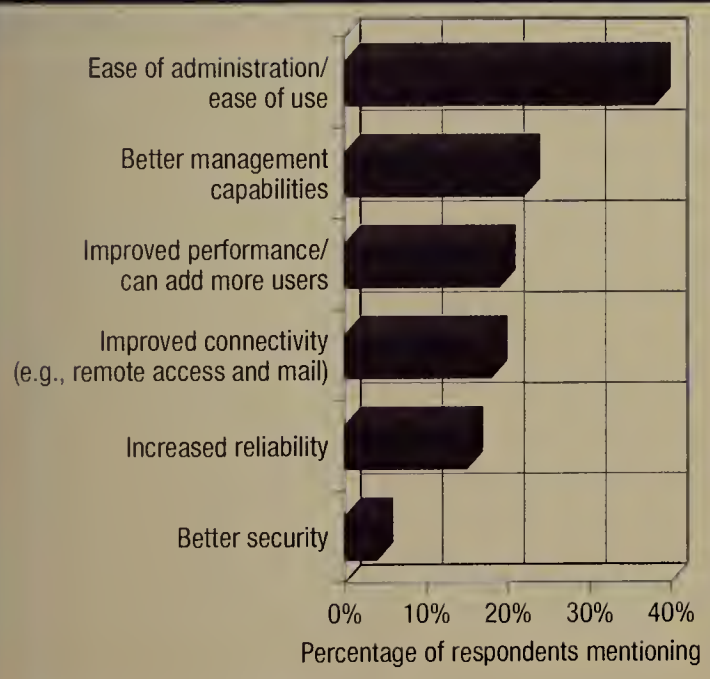
In fact, powerful new management capabilities are why many people are migrating to NetWare 4.1. With more than 375,000

licenses installed worldwide as of 1995, it is the most popular network operating system. Three key reasons for its popularity are:

- Greater functionality
- Improved management
- Directory services

Figure 3 illustrates how survey respondents believe migrating to NetWare 4.1 has enhanced network productivity—with ease of administration at the top of the list, mentioned by nearly 40% of respondents. NetWare 4.1's greater functionality has promoted companies' reliance on LANs and delivered on the ultimate promise of client-server—increased productivity.

Figure 3 — How NetWare 4.1 Improves Network Productivity

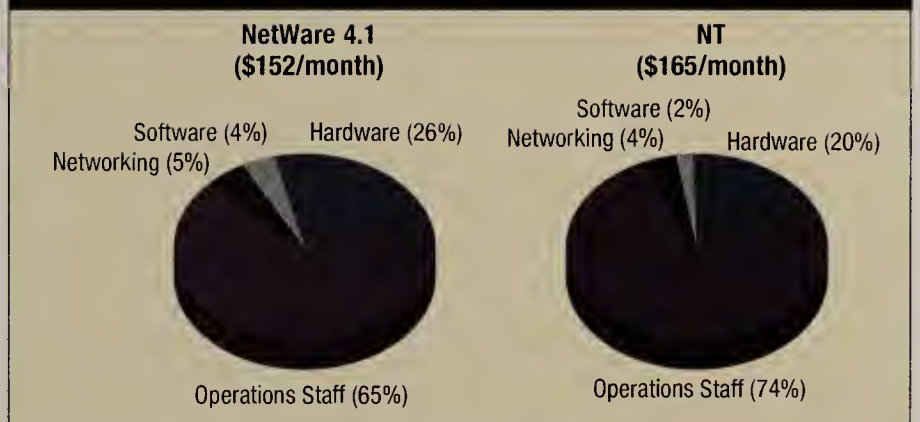


Source: International Data Corporation, 1996

According to recent surveys conducted by IDC, LAN managers report remarkable improvements in managing their networks under NetWare 4.1. Although they expected the number of nodes on their networks to grow by 260% in the 12 months following installation, they anticipated the number of file servers on the network would grow by only 163%. In other words, under NetWare 4.1, they expect to increase the ratio of users per server from 41 to 60—an improvement of 50%.

In addition to increasing the number of users per server, NetWare 4.1 provides a single point of administration with Novell Directory Services (NDS) that results in a lower cost of network administration. Figure 4 shows how, in medium-sized sites, NetWare 4.1 generates 14% lower network administration costs than Microsoft NT, primarily by increasing the user to support staff ratio.

Figure 4 — Network Cost-to-Use at Medium (300 User) Sites (Costs After Migrating from NetWare 3.X)



Source: International Data Corporation, 1996

Novell and other networking companies have set their sights on developing new technologies that will make tomorrow's networks more efficient and flexible. Novell has developed a Smart Global Network strategy, which entails making the network available to anyone—anytime, anywhere. An essential component of the Smart Global Network is Novell Directory Services (NDS), which enables companies to keep track of and connect all of a network's users, workgroups, hardware and software on one common access and administrative framework. NDS provides directory services technology that can handle the management of countless resources on heterogeneous systems spread around the globe. Also fundamental to Novell's vision of the future is an open set of application programming interfaces (APIs) that will make it easy to incorporate NDS and other NetWare 4 networking services into distributed applications.

Providing End-to-End Network Management

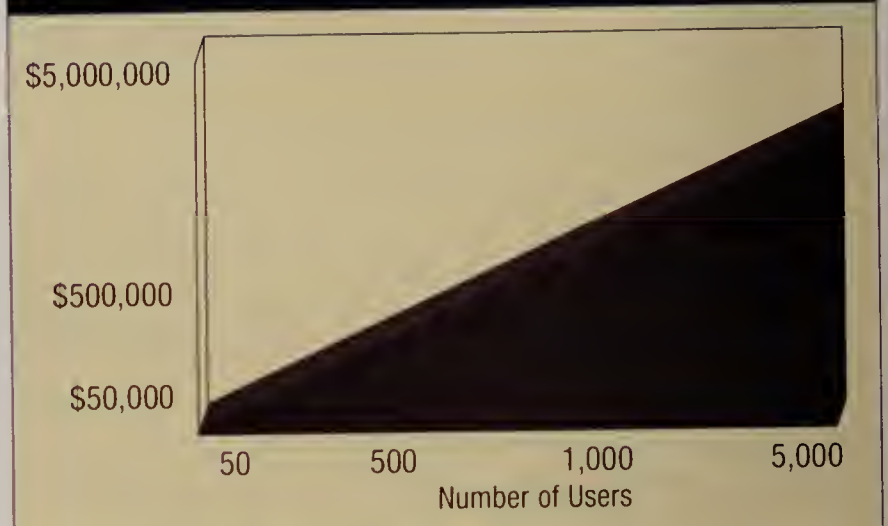
Staffing costs and end-user productivity are the issues that keep IS managers awake at night. And that has never been more true than it is today. As networks expand and intertwine, the critical success factors for network managers will include:

- Increasing network uptime, both in operation and when installing new users or applications
- Increasing efficiency by supporting rapid network growth without commensurate growth in staff
- Increasing responsiveness, fixing problems in a way that minimizes idle time for users or within business processes

To meet these needs, Novell offers ManageWise. It combines both network management and PC administration into a single, integrated package. Previously, most PC administration and LAN management products worked independently of one another, each requiring dedicated staff and resources.

ManageWise is the integrated solution that offers a single view of the network. It provides analysis tools for understanding bottlenecks; permits the configuration, inventory, and diagnostics of PCs from a single local or remote site; and provides tools for monitoring and managing remote and local servers. IDC's research demonstrates that even small and medium-sized companies can achieve significant cost savings by implementing ManageWise (see Figure 5). Network managers found that the most significant gains in efficiency were realized in server operation and help desk functions. Using ManageWise also increased LAN manager responsiveness. Before implementation, only 30% of network or end-user problems could be solved from a central site; afterwards, that number rose to 60%. This is especially important for companies with highly decentralized operations.

Figure 5 — Average Annual Savings From ManageWise



Source: International Data Corporation, 1996

Since the software-licensing, maintenance, and training costs of a product like ManageWise are low compared to the number of users potentially affected, the return on investment can be surprisingly high. Across the survey base polled by IDC, ManageWise paid for itself on average within 19.7 days.

For every 100 users, implementing integrated management with ManageWise saved $95,784 annually. These savings are attributable to the following:

- More efficient systems management, including an increase of 33% in the number of servers and 25% in the number of PCs a staff person can support, and a decrease in travel of 53%, leading to annual cost savings of $14,500
- Significant reductions in the time required to perform key management tasks—such as five hours in moves and changes, nine hours in server maintenance and configuration, seven hours in help desk and support, four hours in problem tracking, three hours in printer maintenance, etc.—saving $30,844 annually
- Dramatic reductions in network downtime (over 50%) due to network outages, delays addressing problems at the desktop, or time spent installing and configuring applications, generating annual savings of $50,440

Cost-Savings and Client-Server: They Aren't Mutually Exclusive

Believe it or not, return on investment in networking can be quantified. While it may sometimes seem that networks are growing out of control, vendors like Novell are in fact working diligently to develop products for simplified, easily managed local, wide-area, and global networks. Because of the strategic and financial advantages of networking wherever systems reside and users roam, organizations will be forced to expand the reach and complexity of their networks simply to remain competitive.

Astute companies will concentrate on migrating to client-server computing in ways that maximize both the resources available to run networks and the effectiveness of those who ultimately generate revenues and profits—namely, end users.

Call to Action

This is an executive overview of a three-part series of White Papers entitled:

- Novell GroupWise: Leveraging Desktop and Network Investments
- Novell NetWare 4.1: Reducing Cost of Ownership
- Novell ManageWise: Maximizing Returns on Networking Investments

For a free copy of the Novell Business Advisor containing tools that help you assess return on investment with NetWare, MangeWise, and GroupWise, as well as electronic versions of the IDC White Papers, call 1-800-665-4586 or visit either the Novell home page at http://www.roi.novell.com or the IDC home page at http://www.idcresearch.com

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Briefs

■ **Concord Communications, Inc.** *this week will unveil* **Network Health 2.5**, *its network performance reporting and analysis software. The new version expands support from SunSoft, Inc.'s Solaris platform to Hewlett-Packard Co.'s brand of Unix, HP/UX. It also includes a module to collect data in remote sites on a WAN, as well as exception and domain reporting capabilities so administrators can focus on one portion of a net.*

Network Health 2.5 is available now and is priced at $9,995.

Concord Communications: (800) 851-8725.

■ **Eicon Technology, Inc.** *last week announced Aviva, a new 32-bit* **SNA terminal emulation** *package for Windows NT and Windows 95. Aviva contains drag-and-drop file transfer and a number of other application integration features that let Windows users mix data from SNA host applications with Windows applications. Aviva costs $295.*

Eicon: (214) 239-3270.

■ *As expected,* **Bay Networks, Inc.** *rolled out Optivity 7.0, which includes new and enhanced applications that take advantage of topological data for logical network representation and* **virtual LAN configuration** (NW, *May 6, page 6).*

Optivity's Network Atlas application enables administrators to interactively view both physical and logical network relationships in a switched environment. The LANarchitect application simplifies networkwide VLAN administration across multiple devices and technologies, Bay said.

With the release of Optivity 7.0, Bay also disclosed a strategy for embedding Remote Monitoring and RMON2 agents in switches, routers and hubs. The so-called E-probe strategy is intended to provide comprehensive statistic collection without degrading device performance.

Optivity 7.0 costs $17,995 and is available now.

Bay: (408) 988-2400.

Ascend rises to ISP occasion

By Jim Duffy and Tim Greene

Ascend Communications Corp.'s pending acquisition of high-speed router maker NetStar, Inc. is intended to stem Cisco Systems, Inc.'s spread into the hot Internet service provider market.

Router Ascend-sion

Benefits of switching router vs. shared-bus router

Switching router	Shared-bus router
▶ Low latency maintained because there's no data bus	▶ Bus latency increases
▶ Cacheless route tables offer full route table lookup and timely route table updates	▶ Route address cache misses occur frequently
▶ Full line speeds maintained	▶ Media line speeds cannot be maintained
▶ Aggregate performance increases	▶ Performance declines

SOURCE: NETSTAR, EDEN PRAIRIE, MINN.

According to Ascend, it plans to buy the Eden Prairie, Minn.-based NetStar for $300 million. The vendor will use NetStar's gigabit routing technology to develop high-speed IP routing and switching devices for ISPs and carriers (*NW*, June 3, page 6).

Ascend is already well-entrenched in ISP points of presence. According to the Dell'Oro Group of Menlo Park, Calif., of the 1.2 million ISDN ports shipped on remote access concentrators, servers, routers and bridges in 1995, Ascend had a 42.5% share. Cisco garnered a 19.7% share, but its premium pricing afforded it a 35.6% share of the $535.8 million in revenue for that market. Ascend had a 27.1% revenue share.

And in addition to routers and dial-access gear, Cisco will soon be able to offer ISPs high-speed WAN switches, thanks to its planned acquisition of StrataCom, Inc. Traditionally, ISPs have StrataCom or Cascade Communications Corp. switches installed alongside Cisco routers and Ascend dial-access devices in their POPs.

So by purchasing NetStar, Ascend is attempting to steal some ISP mind share from Cisco.

"If I'm Cisco, I can supply the whole enchilada; everything works together; it's manageable. They scale. They're granular," said Don Miller, director and principal analyst at DataQuest in San Jose, Calif.

And ISPs should be interested in NetStar's GigaRouter to help cure Internet service brownouts that occur when shared-bus routers drop packets, Miller said. Instead of a shared-bus backplane, NetStar's GigaRouter has a 16G bit/sec non-blocking crosspoint switching matrix that supports 256 point-to-point data paths to alleviate the bottlenecks that cause such brownouts, NetStar officials claim.

GigaRouter can also forward more than 2.5 million 250-byte packets per second, and includes separate switch access/control and communica-

See **NetStar,** *page 23*

Bay secures enterprise nets

By Jim Duffy

Santa Clara, Calif.

Bay Networks, Inc. last week rolled out a security framework for its internetworking devices designed to make enterprise networking more reliable.

The BaySecure framework consists of hardware modules and software for Bay's System 5000 and Distributed 5000 switching hubs; and software for the company's Access Node, Access Node Hub, Access Stack Node, Backbone Node and Nautica routers, and Remote Annex remote access server.

The importance of implementing security in enterprise-wide networks has been heightened of late with the explosion in Internet access and the associated exposure of corporate nets, according to analysts.

"That's clearly the driver," said Nick Lippis, principal of Strategic Networks Consulting, Inc. in Rockland, Mass. "There have been highly publicized disasters around security. [Users] realize that they need security on their Internet access but also across the enterprise Internet."

Components of BaySecure

BaySecure Router Services

- ▶ Integration of CheckPoint Software's Firewall-1
- ▶ Router-based encryption

BaySecure Remote Access

- ▶ Support for Radius authentication protocol in remote access devices

BaySecure LAN Access

- ▶ System 5000 and Distributed 5000 intrusion and eavesdropping detection

Users will second that.

"If you look at the health care industry, the crop of young professionals now are really into technology, whereas five to 10 years ago that was not the case,"

See **Bay,** *page 23*

Software monitors SNA devices over the Internet

By Michael Cooney

Anacapa Software last week introduced a $100 software package that allows the monitoring of SNA and TCP/IP server response times across intranet and Internet networks.

The NetSpeed Intelligent Agent software will reside in any Windows, OS/2 or Unix machine, and keeps track of response time between the PC and a user-defined host.

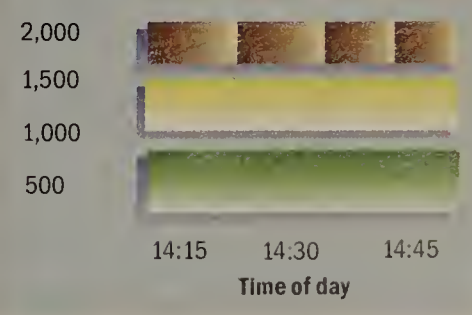
The company is also due to roll out the Enterprise Surveillance Center, an OS/2- and Windows-based console package that registers and displays network performance problems and alerts net administrators when response times are lagging.

The ability to test the response times of multiple servers and track the communications path are among NetSpeed's most intriguing features, said Warren Sullivan, director of marketing and business development for Anacapa. Although many management tools are limited to a few types of servers or communications protocols, NetSpeed is not tied to a particular platform or protocol, he said.

"Rather than wait for hours or sometimes days to see a response-time problem, users can see and address a problem in real time," Sullivan said.

SLOW SPEED KILLS RESPONSE TIMES

Typical NetSpeed response-time graph shows when server frequency exceeded thresholds (red), when its performance was marginal ( ) and when it was better than set thresholds (green).



The NetSpeed agent sends a transaction to a local or remote server and measures the time it takes for the server to respond. In the process, the software tracks the number of routers, controllers or other devices the transaction passes through so that users can see the actual path the transaction takes.

NetSpeed uses Netscape Communications Corp. and Microsoft Corp. browsers to view the data the agent software col-

See **SNA,** *page 23*

INTERNETWORKING MONITOR

Scott Bradner



The Web as Luther, the 'Net as Widener

For me, there were two high points during last month's Harvard University conference on the Internet and Society. (That's if you don't count the end of it. As the organizer for the technology track, I was happy to see it finish with only a bomb scare and a bit of rain.)

The first high point was an insightful talk by Neil Rudenstine, the president of Harvard (and I'm not just saying that to curry favor with my penultimate boss). Rudenstine likened the impact of the Internet on the world of education to the development of the library infrastructure in the major research universities toward the end of the last century.

The second was a keynote by Intel Corp.'s Steve McGeady, in which he likened the Internet's impact to that of the Reformation brought about by Martin Luther. (And I'm saying that in spite of the fact that Steve will be spending the next year at MIT.)

For a number of years now, many people have been searching for some way to describe the potential impact of the Internet on this or that — business, telephones, society, education, the guy down the street, his mother, etc. One of the more common descriptions used by the believers is to say that the impact will be like that of the Gutenberg Press. (I'm guilty of using that analogy myself in this space a few weeks ago.)

But McGeady pointed out that the printing press by itself actually had little impact since less that 5% of the population of Europe was literate at that time of its development. It was Martin Luther, by translating the Bible into German and encouraging people to read and interpret it for themselves — rather than being subservient to the pronouncements of the Church — that had the main impact.

During the late 1800s, many of the major universities, including Harvard (or should I say, especially Harvard) developed very large research libraries. (Harvard's library system, based in Widener Library, now has some 12 million volumes.) The availability of these resources fundamentally changed the structure and method of education in those institutions which could afford them.

Rudenstine pointed out that none of the other technological advances of the past century, from the telephone to television, and including the more recent developments in computer power and flexibility, have made much of an impact on the process of education. But he suggests that the Internet may be a "moment of real transformation."

He also noted that the large libraries were the target of some of the same laments now directed against the Internet, including, "what was to prevent students (and even faculty) from disappearing into the stacks for days on end, pursuing a subject from book to book, shelf to shelf, unable to discriminate easily among the unlimited number of volumes, or to absorb more than a small fraction of the information available on a given topic? And what could possibly prevent less industrious students from simply browsing their lives away in sweet procrastination?"

Could the Web be our Reformation? Could the 'Net be the global library for the non-well off? Take a look at these talks; the past just might tell us where we are.

McGeady's notes are at http://www. intel.com/iaweb/involved/calendar/ harvard.html.

Disclaimer: I was involved in setting up this conference and thus may be biased about its value to society.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached at sob@harvard.edu.



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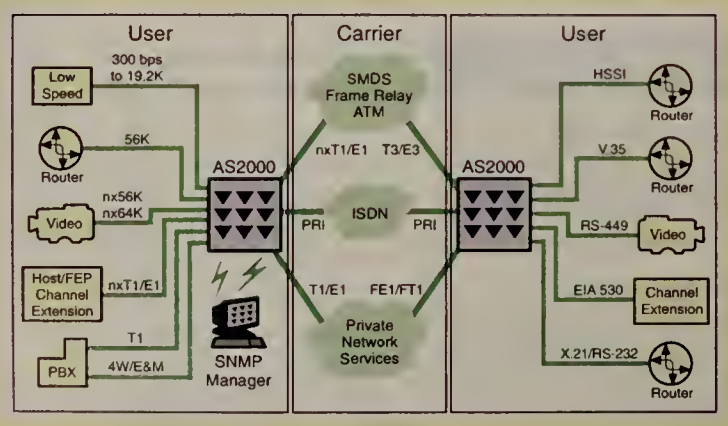
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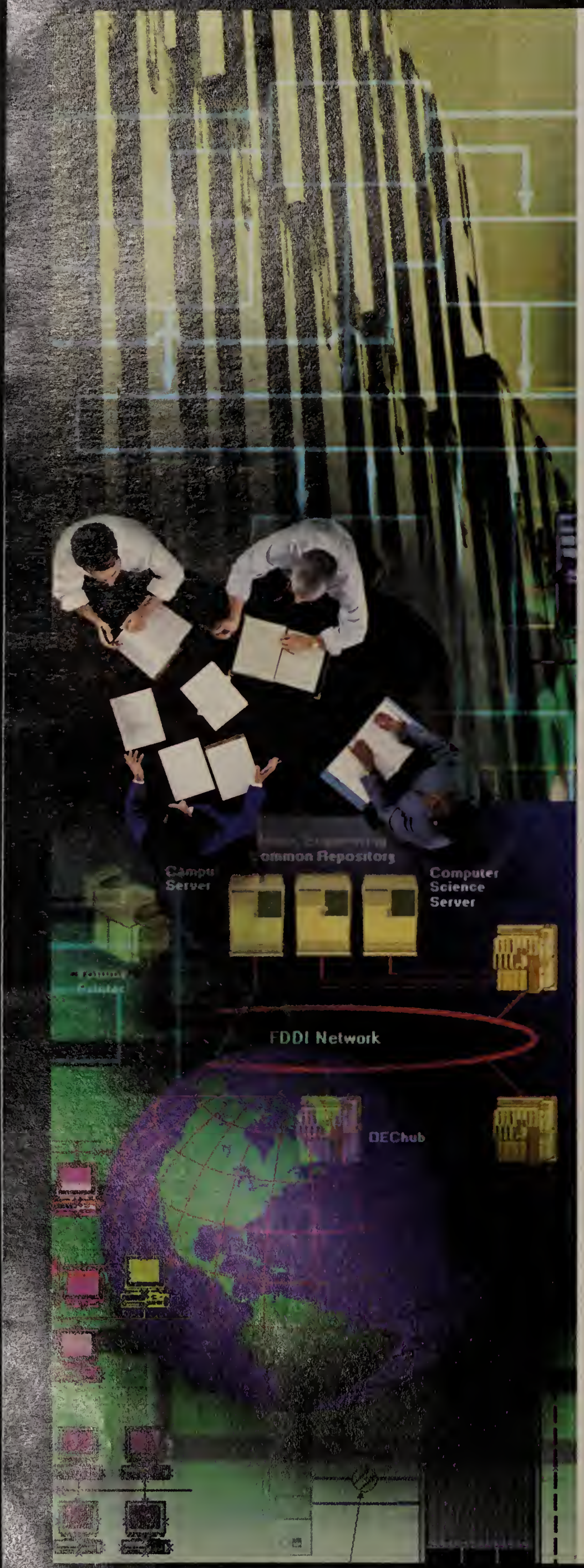
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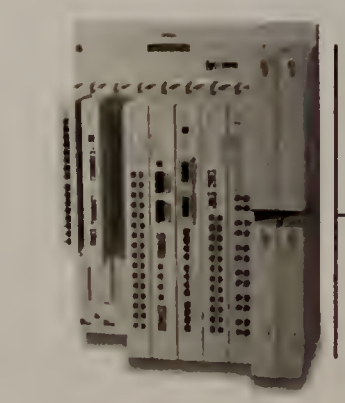
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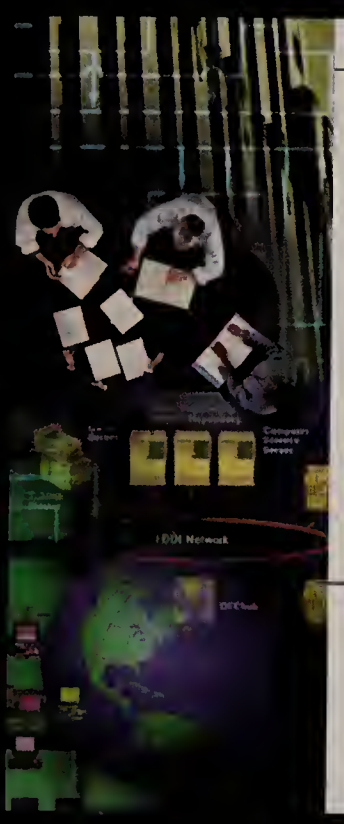




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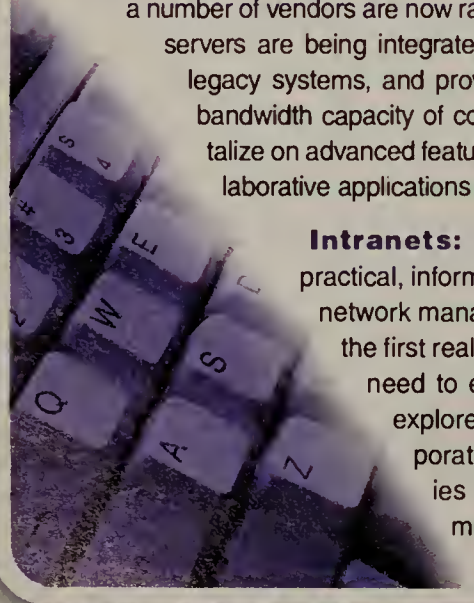


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According to International Data Corporation (IDC), Intranets are growing faster than the Internet itself. The number of Intranet Web servers now comprise 55% of total internet servers and are expected to nearly triple in size this year to more than 200,000 and to exceed 4.5 million by the year 2000.

While Intranet Web servers today act mainly as document publishing systems, a number of vendors are now rapidly extending their functionality. For example, Web servers are being integrated with databases, linked to mainframes and other legacy systems, and providing workflow services. Combined with the high bandwidth capacity of corporate data networks, your organization can capitalize on advanced features such as real-time audio and video as well as collaborative applications and 3-D data representation.



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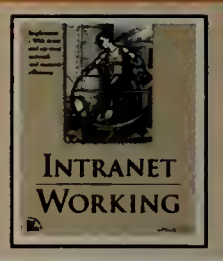
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NetStar

Continued from page 17

tions buses for sending each interface module its own route table, the officials said. Conventional routers store a single, shared route table in cache memory, which limits the size of the table and the frequency of updates, they explained.

Read more about high-speed IP switching and routing online. Select News+ then WANs & Internetworking. Network World Fusion http://www.nwfusion.com

For all these reasons, Miller said, the NetStar buy will let Ascend penetrate deeper into ISP POPs. "They're kind of on the edge of the network. Inside of a large POP, they don't have a solution. All the providers are licking their chops at getting inside the ISP market," he said.

However, according to him, the NetStar router needs frame relay support to be able to do true IP switching. "Now it's just a real fast router," Miller said, but it will be customized to meet the needs of the midsize to large ISP market.

Miller said Ascend's alliance with Stratacom on a dial access server should not be affected, despite the head-to-head competition of Ascend and Cisco (*NW,* May 13, page 8). ■

Bay

Continued from page 17

said George Spenser, manager of network operation at Los Angeles-based managed health care provider Unihealth of America.

That's what BaySecure is intended to do. For the System 5000 and Distributed 5000, Bay rolled out BaySecure LAN Access, which brings data privacy to 10Base-T Ethernet by employing filtering at every port. BaySecure LAN Access is made up of modules for the System 5000 and Distributed 5000, and enhancements to Bay's Advanced Analyzer software.

BaySecure LAN Access modules cost $4,995 for the System 5000 and $1,095 for the Distributed 5000. They are available now.

For routers, meanwhile, Bay unveiled BaySecure Router Services, which provides firewalling and encryption. Bay also unwrapped Radius authentication software for the Remote Annex and Nautica devices.

BaySecure Router Services includes BaySecure Firewall-1, which is based on CheckPoint Software Technologies, Inc.'s Firewall-1 product.

As for encryption, BaySecure Routing Services will support both software- and hardware-based encryption. Software-based encryption will be added to Bay routers in the fourth quarter. Hardware-based encryption will emerge early next year.

Lastly, Bay will ship Radius-enhanced Nautica routers in July and Radius-enhanced Remote Annex servers in August.

✆Bay: (408) 988-2400.

SNA

Continued from page 17

lects. Data is presented in graphs for each server being measured (see graphic, page 17). Users or network administrators can set response-time thresholds that, when exceeded, trigger an alarm.

In an SNA environment, a PC user would have to have a coresident TCP/IP stack and browser software to enable NetSpeed. NetSpeed software also needs to be installed on each PC in the enterprise.

"That's not an unusual scenario today, because in the last three months we've seen an explosion of intranets and it's not at all uncommon for SNA users to have IP access," Sullivan said.

Alarms are registered locally on a designated PC. In the future, they will also be registered on the Enterprise Surveillance Center management console. The Surveillance Center will be able to forward alarms onto a centralized Simple Network Management Protocol-based management platform like Hewlett-Packard Co.'s OpenView or IBM's NetView for AIX.

NetSpeed is available now for Windows PCs. Unix and OS/2 agents are due later this year. The Enterprise Surveillance Center will be available by October and will sell for about $1,000.

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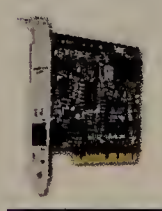
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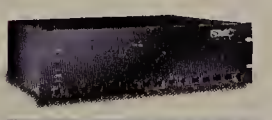
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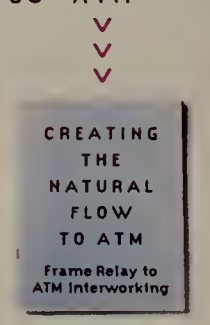
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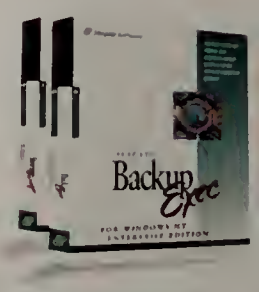
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Network Computing, March 1, 1996



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Jeff Symoens, first looks, *Infoworld*, March 20, 1995

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Heavyweights Square Off for Enterprise Imaging Crown

Ladies and gentlemen, welcome to "fight night" 1996. Tonight we have the battle for the desktop document imaging heavyweight championship of the world. The purse is reputed by some to be worth more than $1 billion, so it is no surprise to find several contenders. At this time there are three heavyweights in the ring:

- In the red corner we have FileNet Corp. and Watermark Software Inc., weighing in with Watermark Enterprise Edition for any flavor of Windows client.
- In the green corner we have Wang and Microsoft, with imaging for Windows 95 and NT clients.
- In the blue corner: IBM and Lotus Development, with Lotus Notes:Document Imaging (LN:DI).

Why are so many heavyweights contesting this market? The main reason is that the stakes have increased dramatically.

The first generation of imaging, based on proprietary technology, automated a department. Second-generation imaging was dominated by vendors providing turnkey solutions using largely standard components. "Now we are in the third generation," notes Jordan Libit, vice president of marketing for FileNet. "Desktop document imaging is the first opportunity to showcase the business benefits of document imaging across the entire enterprise."

Although a contingent of analysts in the press box are murmuring about the absence of revenue streams, vendors remain steadfast in their belief that the winner's purse will be millions, maybe billions, of dollars.

It could be said that the "promoter" behind all this is Microsoft, whose slipstreaming of image viewing capabilities into Win95 at no cost set the ground rules for the fight. The idea of competing for the title of "Desktop Imaging Champion" on a giveaway basis is a classic Microsoft tactic. Like promoter Don King, Microsoft will get no share of the purse . . . but will get a hefty cut of the action surrounding the event. Its windfall should include significant incremental revenue from increased sales of NT, SQL Server, Back Office and, down the road, Exchange.



Round 1

The fight begins in 1992 when Watermark, in Burlington, Mass., puts on a display of fancy footwork by offering its $99 Discovery Edition, a product that takes traditional production imaging vendors by surprise and captures the hearts — if not the wallets — of imaging fans around the world. Watermark wins this round uncontested.

Watch for the remainder of the 1996 Enterprise Storage Management Series:

RAID	August
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This White Paper was prepared under the direction of Scott McCready, Program Director, Electronic Workplace Technologies, at International Data Corp. and Principal of IDC/Avante Technology, Inc., in Framingham, MA. He specializes in workflow, imaging, groupware and document management technologies as well as measuring the business implications of IT in general. Gerry Murray, Senior Analyst, Electronic Workplace Technologies, for IDC and a senior consultant for IDC/Avante, also contributed to the White Paper. He specializes in imaging and workflow technology. Together, McCready and Murray co-authored *Lotus Notes: Agent of Change*, a study that details the experiences of 65 companies, measuring the costs and benefits of technology investments as well as ROI calculations for each one.

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ILLUSTRATION BY CHRISTOPHER BING



Round 2

As the rest of the industry roils with envy at the company's apparent success, Watermark — in spite of what its competitors think — concludes that Discovery Edition simply is not profitable. So the company repositions itself upstream with its Professional Edition and mothballs the Discovery line (except as an OEM product). Unfortunately, it starts to "trash talk" its old product, which hurts its OEM relationships. Watermark wins this round with minimal contention.



Round 3

Here come the big guns. Wang, the George Foreman of the imaging world, shows it can take a knockout punch and still get back in the ring. And like Foreman, who named all his sons George, Wang implements a similar level of naming redundancy by calling all its software products OPEN/something.

Wang uses a legal judo maneuver to bring Microsoft into its corner, parlaying this advantage into:

- Having Microsoft invest $90 million in Wang
- Becoming the provider of desktop document imaging for Windows 95
- Being designated as Microsoft's preferred imaging supplier
- Being designated as Microsoft's preferred work flow supplier
- Gaining the inside track on Microsoft development efforts

This combination has Watermark reeling, yet Watermark somehow remains on its feet and opts for a "rope-a-dope" strategy while trash-talking Wang's ability to deliver. Wang draws first blood and wins this round unanimously.



Round 4

IBM buys Lotus Development for $3 billion. Now the stakes are sky-high. With Lotus SmartSuite and Notes, IBM finally has a desktop software business. Since Notes comes with a free image viewer, IBM by default enters the desktop document imaging ring.

Not to be outdone by its larger rivals, FileNet buys Watermark — whose annual sales are $6 million — for more than $60 million! The crowd gasps! FileNet becomes an overnight contender but the cost is high. Each heavyweight now has not only desktop document imaging but industrial strength production imaging as well. This round is a draw.



Round 5

In July 1995, Wang acquires Sigma Imaging, arguably the best NT implementation on the market, for $20 million, then scores further for embracing NT as the dominant server platform and potentially the most popular networking system.

Microsoft launches Windows 95. Suddenly the light has a worldwide audience, as IDC estimates there will be several million image-enabled Win95 desktops by the end of 1997.

FileNet and Watermark counter with a series of jabs, claiming that Wang's desktop capabilities will be too little too late, and that most Win95 users would benefit from upgrading to their Enterprise Edition. Wang absorbs these body blows and commits to building its Win95 imaging viewer before year-end. Wang wins this round.



Round 6

After the action-filled Round 5, all the contestants try to catch their breath before the next onslaught. FileNet and Watermark announce plans to integrate their different viewers, making Watermark desktop imaging compatible with FileNet's production imaging capability. Wang is busy building its Win95 capabilities; IBM is quietly rethinking its strategy with Lotus. By default, the points for this round are shared equally by FileNet and Wang. But IDC would have given Wang the round had it elected to resurrect its image viewer code for Windows 3.X.



Round 7

IBM announces a connection from Notes to IBM ImagePlus via a mail gateway, as well as a second phase of integration that will provide realtime links between the two products, using ImagePlus as the back-end store for Notes. This one-two combination establishes IBM as a premier supplier of distributed imaging. Lotus has a ready-made market for desktop imaging in the form of 15 million+ Notes and cc:Mail users. Add the 70,000+ IBM ImagePlus users, and IBM/Lotus for the first time looks like they have the measure of Microsoft and Wang. Round 7 goes to IBM/Lotus, and they take the lead

Heavyweights vie to be "one-stop shop"

Wang holds the standard **Microsoft** interfacing piece and has a chance to be the de facto desktop imaging standard. Its OLE Automation implementation is based on the same multiple object layering as MS Word and Excel. And since Wang built its image viewer on a component model using OCXs (now called Active X controls), its viewer and toolkit let one use Access, Visual Basic or PowerBuilder to leverage the OCXs in a frame to build one's own custom application.

Wang's pact with Microsoft entailed developing an extension to the TIFF 6.0 file format standards spec for annotating images. The spec was made available to Microsoft developers in April. Says marketing director Tony Grimsditch, "[Wang] knows how to put an image into the Microsoft client environment in the most convenient way for a Microsoft Office user." The next major NT release will contain a version of the image viewer.

Once Wang supports Active X controls, its image viewer will be a pluggable component in the MS Explorer desktop. Wang has run image-enabled work flow over the Internet. OpenImage users can leverage Wang's desktop capability in their enterprise imaging plans. Wang also offers top-notch document management via a pact with PC DOCS. The missing piece — a Notes-like environment to automate white collar functions — is under development, but time-to-market is key; an acquisition may be a better route.

Kodak developed **Lotus Development's** original desktop imaging viewer. Lotus brought imaging development in-house in 1991, an effort culminating in LN:DI 2.6 and the coming Release 4.

Lotus' advantage, says product manager John Caffrey, lies in providing imaging capabilities to a mature, already rich development platform in Notes. Notes has broad platform coverage and unbeatable security down to the field level, so that a user annotating an image can decide at many levels who is allowed to read it, to change it or even to send it to someone else. In leveraging LN:DI's annotation capability, Notes has no competitors. But the LN:DI viewer should not be reviewed in isolation of Notes functionality.

Once **IBM** acquired Lotus, creating a link between ImagePlus (which is available on AS/400, AIX and MVS/ESA platforms) and LN:DI made sense. Notes users could take advantage of the repository capabilities of ImagePlus; ImagePlus customers would have a desktop imaging option.

A mail gateway between the two products was announced in December; integration at the API level is due later this year. Now, IBM customers can link front-office operations such as sales with back-office processes like invoicing. The reason for IBM purchasing Lotus now is clear. With Notes, ImagePlus and LN:DI, only document management is missing in what could be the richest one-stop shop for customers.

Watermark is still selling well even against free products. A $49 option lets its Enterprise Edition client access the repositories of a **FileNet** production system --- a boon for firms with investments in FileNet products or whose enterprise imaging vision includes desktop and production imaging.

After acquiring vendors of document management and COLD software, FileNet in April proposed an annotation portability standard with Adobe. Under this specification, annotations associated with an image would remain intact while being converted to the PDF file format. The image and annotations could then be read by Adobe Acrobat.

FileNet has also worked with Novell to develop Ensemble, which allows Novell's Groupwise software to route work between two employees and to be integrated with Microsoft Exchange. All this makes FileNet a one-stop shop for firms automating paper-intensive processes.

Heavyweight Desktop Imaging Weigh-Ins

Stats	IBM/Lotus (LN:DI R4)	FileNet/ Watermark	Wang/ Microsoft
Price	($149 est)	$295	Free
IMAGE HANDLING			
Pan, Zoom, Scroll & Rotate	Yes	Yes	Yes
De-skew	No	Yes	No
Grayscale Support	Yes	Yes	Yes
Color	Yes	Yes	Yes
INTEGRATION			
Supports popular file formats	Yes	Yes	Yes
Twain Support	Yes	Yes	Yes
MAPI Mail Enabled	Yes	Yes	Yes
VIM Mail Enabled	Yes	Yes	Yes
Integration with Internet Viewer	No	Yes	Yes
ANNOTATION			
Annotation	Yes	Yes	Yes
Annotation Security	Yes	No	Yes with coding
Highlighter	Yes	Yes	Yes
Sticky Notes	Yes	Yes	Yes
Pop-up Window	Yes	No	No
Drawing Tool	Yes	No	Yes
Standard/Public Annotation Formats	Yes	No	Yes
PROGRAMMABILITY			
OLE Automation using multiple object layers	No (use Notes Flow)	Yes (layers are flat)	Yes
OLE Controls (OCXs)	No	No	Yes
OLE 2.0 Support	Yes	Yes	Yes
Edit in Place	Yes	Yes	Yes
OTHER			
Native 32-bit support	Yes	No	Yes
16-bit app run on 32-bit host	Yes	Yes	Yes
Page Management (add insert, append rescan, delete)	Yes	Yes	Yes
Redaction	Yes	No	Yes
Optical Character Recognition	Yes	Yes	No

Source: IDC/Avante, 1996

on points because they have an economic model for desktop imaging that works! They can afford to give away desktop imaging as long as they sell Notes.

Round 8

Wang opens up and in December, 1995, buys Avail Systems, a Boulder, Colo., vendor of hierarchical storage management (HSM) software, for $32 million in stock. This plan of attack dovetails with Microsoft's future storage management needs for Cairo. More importantly, Wang for the first time has the foundation for fully integrated file management of all data types under the Microsoft/Wang model. The fight begins to go in Wang's favor.

Lotus counters with V4.0 of Notes and Release 4 of LN:DI. Release 4, scheduled for June 1996, looks like it will have significantly enhanced security for annotations. LN:DI is particularly appealing when one considers the platform coverage of Notes and the security features that LN:DI can leverage.

In Round 8, the points are shared equally by Lotus and Wang.

Round 9

The fight shifts to include more than just imaging at the desktop. Imaging is now seen as simply one component of the full desktop automation environment. Most customers begin to recognize that desktop document imaging should be purchased in conjunction with other technologies such as production imaging, work flow software, document management, groupware and Internet browsers. This development dramatically shifts the fight's momentum.

Wang releases its imaging for Windows 95 on time. The feature set exceeds press expectations. Win 95 now includes image display as expected, and Wang has built in scanner controls, fax in/out support and full annotation features. These components are built as OLE 2.0 modules that Wang and Microsoft distribute freely over the Internet.

Wang presents its annotation capability as an open, public format, unlike the private TIFF tags of other vendors. This specification should give customers a higher degree of compatibility between different vendor approaches. Round 9 goes to Wang, but many fight fans think it should have been able to get a standing count against FileNet and IBM.

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Round 10

Wang has its opponents on the ropes, but fails to land the knockout punch. Although Wang is showing an impressive display of punching power, its opponents continue to move effectively in the ring.

After the exertion of getting imaging for Win95 in the box, Wang seems to be tiring. In spite of delivering a great toolset, Wang has not taken the fight home to the third parties, nor has it delivered an upgrade path to ignite the fans and provide a revenue stream. Nor has Win95 turned out to be the juggernaut that Wang expected.

Wang returns to its corner sputtering about OCXs on its home page, please download. On a brighter note, Wang ships 142 production imaging systems in the quarter ending 12/31/95, with revenues more than double the same quarter in 1994.

Meanwhile, FileNet is bulking up in preparation for a new strategic direction. Having already acquired Watermark to fulfill its desktop imaging requirements, FileNet in January 1996 acquires for an undisclosed sum International Financial Software Ltd., the New York, NY developer of Greenbar Computer Output to Laser Disk (COLD) software and in February buys Saros Corp., a Bellevue, Wash., vendor of document management software for $100 million. FileNet now has a punching combination that Wang and IBM can't presently match. FileNet releases Ensemble, a workgroup level work flow product, and brings Novell into its corner as a distribution partner. This shows that the Wang/Microsoft assault has only made FileNet a more hardened contender. Round 10 goes to FileNet.

Round 11

FileNet plans to issue a joint specification with Adobe for annotations that support the PDF and TIFF file formats. It fails to mention that a public

Desktop Document Imaging



Document imaging — the technology that allows you to scan any business document, then display it as a bit-mapped image on a computer — has been around since the early 1980s. Vendors such as Wang, FileNet and IBM have done good business providing turnkey imaging systems that allow one to process literally millions of pieces of paper. These production imaging systems are installed in thousands of companies and every day more than 1 million workers process document images rather than sift through paper.

Desktop document imaging is suited for scanning the occasional magazine article and keeping a small number of images on individual hard drives. Desktop imaging should also allow one to occasionally access production imaging systems, thereby providing enterprise-wide image access and display capability.

Desktop imaging differs from production imaging primarily by volume. A typical desktop imaging user might scan in a handful of documents at one sitting; a production site can scan thousands of images per hour. As a result, input capabilities, performance issues and storage requirements differ substantially from one system to the next.

IDC believes that for prospective customers to have an effective enterprise-wide imaging strategy, they should purchase desktop document imaging with production imaging in mind and also with how it will fit with future acquisitions such as groupware, document management, work flow and the Internet.

Desktop document imaging will increasingly be a standard component of most PCs. Viewing technology has already been subsumed into the operating system and is also available as a free Internet browser plug-in. Personal scanners are being bundled into PCs and keyboards. Thus, a grassroots introduction to the technology will take place in the mainstream market over the next three years.

But users must realize that desktop imaging is not an end in itself. Its true business benefits will be achieved only if it is tightly integrated with an ambitious vision of automation at the desktop. The market is already evolving along these lines and the integration and standardization work underway will ensure that the value proposition for customers will continue its dramatic increase.

annotation specification has been available from Wang and Microsoft for some time. FileNet's specification is preliminary and is not compatible with what is already available from Wang and Microsoft.

Although FileNet announces that it shipped 97 production imaging systems in 1Q 1996 with record revenues of $66.7 million, the firm's nose gets bloodied by Wall Street as it takes a $16 million write-off and a first-quarter loss on "lumpy" performance from Saros and an R&D close-out from International Financial Software. Despite these short-term profitability issues, FileNet looks stronger than ever from its product and market strategy perspectives, and the pressure is on IBM and Wang to respond. IDC believes that both will have to go the acquisition route to compete with FileNet's one-stop shopping approach.

There are still four rounds to go, but if we stopped the fight now the winner would be. . .

The customer. Not only is desktop imaging software literally free, it introduces users to the technical issues and, more importantly, business benefits of ancillary technologies such as production imaging, work flow, groupware and document management. Whether one goes with the toolkit advantages of the Wang-Microsoft approach, the state-of-the-art container design of Lotus, or FileNet's one-stop shopping strategy may ultimately make little difference. Each offers the user an easy point of entry and the ability to leverage an array of technologies.

Post-fight analysis

The early rounds, and many of the slower middle rounds, went to FileNet and Watermark. Watermark had established a significant installed base and a set of reference accounts. FileNet upped the ante by bringing imaging, work flow, document management, COLD software and some form of collaborative computing capability together. In the short term, FileNet took it on the chin with lumpy results from Saros but its overall strategy is compelling.

In the middle rounds, Lotus was bolstered by IBM's purchase, and got more points when IBM added to Lotus' repertoire of moves with ImagePlus. This is a powerful combination for customers automating the enterprise. In addition, IBM can provide imaging at the desktop for free, while making money from Notes and production class ImagePlus installations. This is where IBM is tops: It has an economic model that works for both the vendor and the customer.

In the later rounds, Wang had the opportunity to set the standard for imaging at the desktop. However, the market shifted and although Wang delivered more than it promised, Windows 95 sales were less than expected. This gave the competition some breathing room and also put pressure on Wang to develop a broader market strategy or run the risk that FileNet and IBM/Lotus will do an end run.

Wang is the only vendor with a public specification and an excellent toolkit downloadable from its home page at no cost. Add to this its installed OPEN/image customer set (55,000 seats and growing) and its acquisitions of Avail and Sigma, and Wang has the underpinnings of a very sound enterprise-wide strategy for imaging.

Technological ins and outs

The ability to use a single viewer to display images from several vendors' image repositories is a key part of an enterprise-wide imaging plan. IDC believes that 80% of the companies that have invested in production imaging have a multivendor imaging environment. Those that can benefit most immediately from having enterprise-wide access to their existing image repositories will be the first to face the issue of standards.

All image viewers support the popular TIFF format. But because annotations to the images are contained in a private tag that is unique to each vendor, in most cases a user on a different platform can display the image but not the associated annotations. Furthermore, the security associated with annotations — i.e., who can make changes and who cannot — is lost. So although current technology allows a degree of interoperability, the industry still has far to go to make enterprise-wide imaging a no-brainer.

In all fairness, Wang has made public its annotation capabilities. The result is that even people who do not use the Microsoft engine can still read and write to the files and read and write the annotation data. At AIIM '96 (the Association for Information and Image Management) in Chicago, an exhibitor demonstrated on a Macintosh its ability "to read and

Imaging Raises the Need for Storage

Imaging is a storage vendor's dream. While the typical data packet might hold about 4KB of information, a scanned page or bit-mapped image, even in a compressed format, may average 50KB. Across the board, imaging files are significantly larger than data files.

In companies that have deployed document management solutions, where tens of thousands of pieces of paper are processed every day, the storage requirements are enormous. To provide the performance that these users require, production imaging vendors have created sophisticated storage management software. By migrating bit-mapped images from optical media to magnetic media to the user workstation through caching schemes, this software allows users to retrieve images much faster.

Storage requirements are growing in every corporation, but particularly in those with imaging applications. Desktop imaging environments now require as much storage as those for production imaging. In a production imaging environment, 100 people may each process 10,000 pieces of paper daily. But 500 employees in a company with imaging at the desktop may create nearly the same volume. And when each page is 50KB, even a 1GB disk will fill up pretty fast.

This is why hierarchical storage management, or HSM, for desktop applications is just as vital as a good repository for production imaging environments. (One reason Wang acquired HSM vendor Avail Systems in 1995 was to co-develop storage management software for Cairo.)

Imaging systems are helping firms conserve physical storage space. The average optical drive can hold the paper equivalent of a dozen file cabinets. But storage technology — whether images are being put on magnetic disk, tape, optical devices or paper — is no substitute for proper records management policies. Such policies depend far more upon the industry than a technology; for instance, storage requirements for the mutual funds industry are much more stringent than those for the advertising world.

Many companies keep images on magnetic media, then copy these images to a write-once, read-many (WORM) optical drive to create a permanent archival record that cannot be changed. Of course, permanence is relative. Optical vendors are quoting read lifetimes of up to 50 years. But those same drives may have write lives of only 10 to 15 years. If the drive is not written to in that time period, it never will be.

However, when it comes to storage media, companies need not worry about the risk of technological obsolescence. The storage industry has continually done a great job of having backwards compatibility, and there is no reason to think that will change.

Right now, the hot buzzword in storage and retrieval technology is COLD (Computer Output to Laser Disk). COLD server software writes and indexes mainframe reports onto laser disk. COLD client software lets users search the data stored on disk much faster than with microfiche or by sifting through printouts. Now, instead of running thick mainframe reports that most employees need to see only a small part of, many companies put these reports on laser disk and give their users indexing software. Users can call the report up on a PC and read portions of it.

Some companies use COLD as a low-cost, low-risk entry to imaging. IS shops know how much it costs to print mainframe reports and distribute them, so if they can't get management to buy off on imaging, they may take the intermediate step of implementing COLD, which is easy to sell to management because of its clear cost benefits. Once seen as purely an alternative to microfiche, COLD can now handle documents in a company.

So if you're a betting person, rather than deciding which heavyweight will wear the imaging crown, the sure thing might be to put your money on the storage vendors.

write the Wang/Microsoft annotations and some WIN 3.1 stuff. So clearly it works," notes Alan Hardy, director of imaging product marketing at Wang. "We are willing to work with other vendors to ensure they can take advantage of what we have done, because customers have to be secure in the knowledge that they are getting the complete file."

Prospective customers need to realize that desktop images should be in one file, to provide capabilities such as portability and mailing. However, in a production imaging environment, you need to separate the image document, so that the annotations are stored on magnetic technology [media] while the image data is on optical, for performance and storage management reasons. In some cases, it makes sense from performance and security perspectives to store the pages separately.



> Much of the file format and annotation standardization required for broad use of imaging can be best solved by adopting an OLE Store approach.

For desktop imaging to become truly viable as an enterprise-wide technology, IDC believes that:

- Imaging must become as ubiquitous as other desktop applications; and
- The gap between desktop imaging and production imaging must be bridged.

The ubiquity of imaging is rapidly being realized through: 1) Wang's imaging in Win95 shipments; 2) Increasing availability of image viewers as plug-ins to Internet browsers; and 3) The bundling of scanners in PCs and keyboards as standard components.

IDC believes that much of the file format and annotation standardization required for broad use of imaging can be best solved by adopting an OLE Store approach. For example, OLE Store image documents could be included in Office 95+ binders, have their properties exposed in an Exchange inbox, or use Microsoft search tools such as Advanced Find to index and retrieve documents based on metadata such as a customer's account number.

Issue #2 — the gap between desktop and production imaging — can be resolved if production image vendors access images through a standard interface. If OLE Store becomes a de facto standard, the application would not need to know that at some point the image file had been one physical file on the hard drive, or that at another point it had been spread out to different storage locations. In fact, with OLE Store, the application no longer needs to know where the different elements are stored.

One can argue for an alternative approach to an OLE-compatible document format. However, if Microsoft takes the OLE Store concept further by defining a standard annotation model for OLE documents (Excel, Word, Powerpoint and Wang/Microsoft viewer), the entire industry would take a big step up the standardization ladder, making it easier to have desktop imaging as a plug-in technology.

Advice from "the Greatest"

Muhammad Ali's slogan, "Float like a butterfly, sting like a bee" is good advice for the IS community. Desktop imaging requires much pollination to become pervasive in an organization. But you have to ensure that individual projects are not needlessly repetitious. Applications should have a common look and feel, and security and administrative practices must be consistent across the organization.

IS will have to support a wide assortment of input devices, including scanners built into monitors, keyboards and PCs. IS also will be required to support multifunction devices and hand-held input capabilities, as well as the more common standalone scanning capability (double-sided). If input devices are poorly matched to the job at hand, maintaining them will consume large amounts of IS resources

The technical issues associated with desktop imaging and production imaging differ, but a good enterprise plan takes both into account. IS also has to face three other issues: Does desktop imaging need to be integrated with fax or E-mail to make people more productive? Is it better to use multifunction devices or standalone scanners? How important is color for low-volume scanning?

Ultimately, the productivity impact of imaging on your enterprise will be directly related to answering these questions properly . . . before your users run out and do it on their own. ■

Enterprise-wide Imaging

Doing It Without Mirrors

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Briefs

■ *Got something you need to tell* ***the Federal Communications Commission,*** *such as a* ***complaint against a carrier?*** *Now you can do so through its toll-free line, as the FCC last week inaugurated its National Call Center in Gettysburg, Pa. But there's a catch: The line is currently only available to callers from Maine, Virginia and Florida. The agency said it needs more time to hire staff, train agents, and test hardware and software before taking calls nationally. The FCC's toll-free number is (888) 322-8255.*

■ ***MCI Communications Corp.*** *released pricing for its new networkMCI Backup service, which provides users of standalone and mobile PCs with encrypted* ***off-site storage of files*** *at mirrored MCI facilities.*

For example, a user storing 10M bytes of data — equivalent to 2,500 pages of text — will pay $12.95 per month. A free charter trial is available through September. Users receive Windows software to launch the application and to designate which file names or types, such as documents, spreadsheets and presentations, are to be backed up.

■ ***AT&T*** *named its top carrier network official to the board of directors of the* ***Alliance for Telecommunications Industry Solutions (ATIS).*** *Frank Janna, vice president and general manager of AT&T network and computing services, has been an active member of the Federal Communications Commission's Network Reliability Council, which works through ATIS. The alliance also sponsors industry forums on issues such as network interconnection standards and telephone numbering.*

■ ***MFS Communications Company, Inc.*** *announced that its operating unit, MFS Intelenet, has* ***opened offices*** *in Cleveland, Phoenix and Silver Spring, Md. MFS Intelenet bundles local and long-distance service, voice mail, calling card, 800/888 services and telephone equipment, all with customized billing and management reports.*

EMI offers do-it-yourself frame relay monitoring

By Joanie Wexler
Syracuse, N.Y.

Users of EMI Communications Corp.'s frame relay service recently gained the ability to monitor their own networks.

Regional interexchange carrier EMI added Enhanced Customer View to its frame portfolio late last month — the fifth frame service it has announced in the past several weeks. The carrier's latest move gives users running TCP/IP-based application software from EMI on an NT, Windows 95 or Unix client a passive look at traffic statistics for ports, permanent virtual circuits (PVC) and local loops. The data is served up in tabular spreadsheet and graphical formats.

User view

How much control users have over their public frame relay networks could be a make-or-break criterion, analysts say.

Carriers' customer frame relay net management capabilities (based on a survey of 22 carriers).



SOURCE: DISTRIBUTED NETWORKING ASSOCIATES, GREENSBORO, N.C.

Users will pay a service charge equal to 3% to 9% of their monthly frame relay bill for the service, said Mark Pugerude, director of marketing and product development for EMI. The percentage is dependent on user volume and service term commitment, he said.

What's going on?

Monitoring information allows telecommunications managers to make network configuration decisions based on usage patterns and trends. Users and analysts said this is particularly important to networking managers who are transitioning from private networks. Despite the fact that carrier services are attractive largely because they shield the customer from network intricacies, many veteran networking managers are accustomed to having total control over their nets.

"We haven't completely divorced ourselves from network management just because we've gone with a service," said Michael Cardali, MIS manager at Somerset Tire Service, Inc. in Bound Brook, N.J., an EMI frame relay customer.

Cardali said he has some basic monitoring capabilities today through utilities for frame relay access devices. "But they aren't graphical, and there is no overall view of the network unless we dial into all 70 FRADs," he said.

Because network managers still feel a strong responsibility for their network's performance, "the degree to which carriers allow customer network management is one of the key decision factors in choosing a service," said Steve Taylor, president of Distributed Networking Associates, a consulting firm in Greensboro, N.C.

However, most users would like to be able to take action on their networks, he said. For example, they would like to be able to reconfigure the size of the committed information rate — the minimum speed guaranteed by the carrier — on a PVC themselves rather than calling the phone company and waiting three days for the change.

Today, the only carrier offering that capability is LCI International, Inc.

In March, a third of 22 carriers surveyed by Distributed Networking on behalf of the Frame Relay Forum said they offer some degree of customer network management based on the forum's FRF.6 standard specification. But only 10% more said they intend to offer FRF.6-compliant capabilities. ■

Company does ATM, and ATM only

By Tim Greene
San Diego

Broadband users that want the ease of use of the Internet but with faster speeds, better security and guaranteed service quality can deal with a carrier specializing in just one thing: ATM.

San Diego-based ATMNet is in the process of setting up a coast-to-coast fiber network offering services from 4M to 155M bit/sec through its Enterprise Network Service. The goal of the company is to give users intranets that offer security and guarantee quality of service for varying traffic types, said Jim Browning, president of ATMNet.

ATMNet users include Internet Service Providers (ISP); entertainment companies that need predictable response times for interactive gaming; a cable modem maker that wants to offer cable carriers an Internet access service; and a color separation house that needs to send large files among sites.

The company within 60 days also plans to roll out a voice service whereby private branch exchange traffic would be carried over an ATMNet link with other traffic, then split off to a long-distance carrier. To make it work, a Fore Systems, Inc. ATM switch sits between the user's PBX and the ATMNet network.

While currently only servicing customers in California, the company plans to expand its high-speed net nationally and internationally by the end of the year. ATMNet has a lead on other all-ATM network providers that will likely come on the scene in the next few years, according to Frank Dzubeck, president of Communications Network Architects, Inc.

ATMNet focuses on intranet and Internet traffic, but is prepared to go beyond that. "The bulk of our traffic is IP over ATM, but we can handle native ATM," Browning said.

The ATMNet network architecture also includes access centers where users can place servers directly on the OC-3c backbone. This avoids bottlenecks that lower speed access can cause and eliminates the need to buy access circuits that size themselves.

By meeting the Internet at access points, it also effectively boosts the backbone speed of the Internet. The company has plans to eventually push its backbone to OC-12, Browning said.

ATMNet, founded last summer, is similar to the older and larger UUNET Technologies, Inc., whose infrastructure is leaning toward ATM but, because it was started earlier, is not based solely on ATM.

Dzubeck said the company has potential competition at any time from any of the established large long-distance carriers that might want to get into similar businesses.

©ATMNet: (619) 643-1300.

CASTING A BROADBAND NET

ATMNet hopes to capture high-bandwidth users, including ISPs, with its OC-3c nationwide network. The network is designed to provide large corporate users with Internet access as well as intranet services.



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What you need are Ethernet adapters smart enough to get more throughput on every utilization without sucking the life out of CPUs. Or that can give full-duplex performance and increase bandwidth by a factor of 8. And guess what? We just created them. And if we tell you these little beauties only require 4K of conventional DOS memory, whereas other adapters gobble up 80K for device drivers and LAN protocols, imagine the DOS and Windows® applications you could load into memory without affecting your network performance. It's enough to give you goose bumps. And the best news of all is the low price of these little gems. You may also be surprised if you've sneaked a peek at our logo. Because yes, this is IBM, and no, we're not talking Token Ring. For more surprises, visit our Web site at www.raleigh.ibm.com/netad.html or call us at 1 800 IBM-2468*, ext. DA125, and get up to speed.

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Local Networks

Covering: Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ **Intel Corp.** *this week will announce LANDesk Virus Protect 1.6 for Windows NT Servers, which now includes real-time* **virus scanning.** *The new Windows NT version also includes scheduled and on-demand virus scanning, generally used to detect new viruses. Version 1.6 can also scan compressed files. The software is priced at $995 for a single-server license, $2,985 for a four-server license and $9,950 for a 20-server license. It will be available next week.*

Intel: (800) 538-3373.

■ **Unison Software, Inc.** *this week will introduce* **RoadRunner 3.0,** *its enterprise storage management software for all major brands of Unix. RoadRunner 3.0 includes a new redundant catalog management feature that lets customers store indexes of files, volumes and backups across a network. These files can then be easily retrieved if a system failure occurs. RoadRunner 3.0 is available now starting at $4,000.*

Unison: (408) 988-2800.

■ **Packard Bell Electronics, Inc.** *and* **NEC Corp.** *announced an agreement last week to merge their PC operations outside of Japan and sell new products under a new company name,* **Packard Bell-NEC.** *The new company will be based in Sacramento, Calif., currently Packard Bell headquarters, and will combine development, manufacturing and sales efforts. For now, the two brand names will remain separate, but in time the companies may sell PCs under the brand name PB-NEC.*

The new company will operate worldwide, with the exception of Japan and China, where NEC will continue to manage its own business. Packard Bell will receive $300 million in NEC assets. Packard Bell has had a recent series of financial setbacks and some expected it to be swallowed up by another PC maker.

Cabletron snags ZeitNet to bolster ATM arsenal

Adaptec captures Cogent for Fast Ethernet network gear.

By Jodi Cohen

Cabletron Systems, Inc. last week broadened its high-speed switching product portfolio by acquiring ATM vendor ZeitNet, Inc. for about $140 million in stock.

The deal enhances Cabletron's Asynchronous Transfer Mode product line, which currently is based largely on products it resells from Fore Systems, Inc. The acquisition gives Cabletron many more in-house ATM resources, allowing it to build ATM technology more tightly into its existing gear.

"This will give us additional freedom and flexibility as to what we can do with the technology, including embedding it into future Cabletron switches and integrating it completely with our SecureFast VNS [VLAN management software]," said Tim Hale, Cabletron's ATM product manager.

But many industry observers said ZeitNet's gear overlaps with Cabletron's existing ATM product line. Cabletron resells Fore's complete line of ATM adapter cards, and offers a range of Fore-based and internally developed ATM access devices and high-end switches.

Hale, however, emphasized that the Fore relationship will continue to be strong, with long-term contracts in place for co-developing 2.5G and 10G bit/sec ATM switches.

The acquisition — Cabletron's second in two months — gives the company new ATM software, adapters and a low-end Fast Ethernet-to-ATM switch.

"ZeitNet is a small player in a relatively small market," said Justin Smith, an analyst at International Data Corp. (IDC), a market research firm in Framingham, Mass. "But it's a fast-growing company that is doubling its unit shipments about every six months and should be easy for Cabletron to absorb."

ZeitNet held 12% of the 1995 worldwide ATM network interface card market, which was fourth behind Fore Systems, Inc., Efficient Networks, Inc. and Adaptec, Inc., according to IDC.

Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J., said ZeitNet has one of the market's most advanced sets of ATM software, including good drivers, application software and APIs. "Cabletron may have chosen ZeitNet to

See **Cabletron,** *page 28*

Cabletron and ZeitNet join forces

Company:	Cabletron	ZeitNet
Headquarters:	Rochester, N.H.	Santa Clara, Calif.
Products:	LAN and ATM switches and hubs; network and systems management software	ATM adapter cards, access devices and software
Financials:	$1.1 billion (past four quarters)	More than $5 million (fiscal 1996)

ADC buys half of Codenoll

ADC Telecommunications, Inc. last week announced that it has acquired 50% of fiber-optic Ethernet equipment vendor Codenoll Technology Corp. for an undisclosed amount.

The deal will give ADC and its Fibermux subsidiary access to products that their customers need to upgrade from 10M bit/sec Ethernet to 100M bit/sec LANs.

Fibermux offers the Crossbow line of copper- and fiber-based 10Base-T hubs, but until now lacked a migration path to Fast Ethernet.

Along with the acquisition news, Codenoll aired its CodeNet-Centaur product line, which includes Ethernet switches, Fast Ethernet hubs, network interface cards and transceivers. The products are designed to make it easy and inexpensive for Ethernet users to upgrade to Fast Ethernet while preserving their investment in existing equipment.

"Our new products will allow Codenoll and Fibermux customers to immediately begin upgrading their LANs to 100M bit/sec Fast Ethernet for as little as $4,000 per LAN," said Michael Coden, chief executive officer of Codenoll.

Contact ADC at (612) 938-8080 and Codenoll at (914) 965-6300.

—Jodi Cohen

Digital blends VMS and NT wares

By Ben Heskett

St. Louis

Battling skepticism from OpenVMS loyalists, Digital Equipment Corp. last week rolled out a second wave of products intended to make it easier for customers to run Windows NT and VMS applications on the same network.



Digital's *Melling*

Digital's Affinity program is designed to keep a large installed base of OpenVMS customers happy while supporting the increasingly popular Windows NT desktop and server operating systems.

The latest announcements, which were made at the Digital Equipment Computer Users Society conference, include new products for Windows NT/OpenVMS integration in these areas:

■ Management — Digital introduced OpenVMS Management Tools for Windows NT 1.0, a set of tools that works with Polycenter Manager on NetView for Windows NT 3.1, Digital's network management application set. The combination lets customers manage an OpenVMS machine from a Windows NT console, and gives an administrator performance and asset management capabilities.

■ Messaging — The company rolled out MAILbus 400 Message Transfer Agent 2.0, MAILbus Monitor 2.0 and Digital X.500 Directory Services 3.0, products intended to let customers run messaging applications across OpenVMS and Windows NT machines.

■ Directory Services — All-in-one OpenVMS messaging files can now be accessed via a Web browser on an NT workstation, for instance, with no HTML conversion necessary.

■ The Internet — Digital is providing a CD-ROM called OpenVMS Internet Product Suite 1.0 that includes browsers, Web servers, a firewall and freeware for OpenVMS customers also running Windows NT.

In addition, Digital is offering a package for software developers that will make it easier to build OpenVMS applications that can be easily ported to Windows NT machines.

Digital will stick to a road map of Affinity program announcements every six months, according to Wes Melling, Digital's OpenVMS systems group vice president.

The next series of announcements will include gateway functions that allow Windows desktop users to access OpenVMS servers, as well as clustering and network infrastructure announcements.

✆Digital: (800) 332-4636.

MORE ONLINE

Learn more about products for integrating OpenVMS and NT on Network World Fusion (http://www.nwfusion.com). Select News+ then Local Networks.

Network World Fusion

Cabletron

Continued from page 27

stake out the next level of the ATM fight, which is ATM middleware," he said.

Cabletron also said it plans to honor ZeitNet's existing OEM agreements with companies such as Cisco Systems, Inc. for network interface cards.

Adding to Adaptec

In other acquisition news, Adaptec last week announced that it will snap up Fast Ethernet vendor Cogent Data Technologies, Inc. for $68 million in stock.

The addition of 100M bit/sec adapters, repeaters and switches to Adaptec's line of SCSI and ATM adapters for servers and workstations will give its customers more high-speed connectivity options.

In addition to Fast Ethernet, Cogent has developed proprietary gigabit Ethernet technology that provides customers with up to 10 times the performance of existing 100M bit/sec gear. Adaptec is interested in the technology, and is evaluating plans for future server and storage connection products.

IDC's Smith pointed out that customers are starting to question ATM's role in their networks and Adaptec's move into the Fast Ethernet space is quite timely. "I hesitate to say that Adaptec is doing this because of all the bad press regarding ATM recently, but it certainly enables them to play in both areas," he said.

Charles Anderson, founder and president of Cogent, said the deal is good news for customers. "This provides Cogent [with] a deeper resource [from which] to be able to provide a broader range of products," he said. "We will continue as planned with our products and strategies, and this deal shouldn't cause any heartburn for our customers." ■

Adaptec and Cogent unite

	Adaptec	Cogent
Company:	Adaptec	Cogent
Headquarters:	Milpitas, Calif.	Friday Harbor, Wash.
Products:	SCSI host adapters, mass storage controllers, ATM network interface cards	Ethernet and Fast Ethernet LAN adapters
Financials:	$659.3 million (fiscal 1996)	Would not disclose (privately held)

Apple turnover takes place at top

By Sari Kalin
Cupertino, Calif.

The president of Apple Americas has resigned in conjunction with a reorganization of the ailing computer company's top executives, according to company officials.

James Buckley, an 11-year veteran of Apple Computer, Inc. and a senior vice president, is leaving to pursue unspecified interests, officials said.



Apple's Amelio *to oversee top executives.*

"He views the restructuring as an opportunity to pass the baton on to his successors," an Apple spokeswoman said. "He also said that he is a builder of organizations, and the time has come to pursue new interests outside of Apple."

The reorganization restructures the company so that six top executives will report to Gilbert Amelio, Apple's chairman and chief executive officer. These executives are chief operating officer, chief administrative officer, chief technical officer, chief financial officer, senior vice president of corporate marketing and vice president of strategic planning.

Amelio will also fill the role of chief technical officer, pending a permanent appointment. He will oversee AppleSoft, AppleNet, Apple Advanced Technology Laboratories, and the Apple Reliability and Quality Assurance Group.

Kalin is a correspondent for the IDG News Service Boston bureau.

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WIRED WINDOWS

Jamming Java into your LAN

I've been having trouble sleeping lately, which my wife attributes to too much caffeine. More precisely, I figure it could be a Java overdose.

If you're at all interested in LANs from a software standpoint — I'm talking about the network operating system as well as directory services, security, management and software distribution — then you've probably been reading a lot about Java, intranets, ActiveX and browsers.

Not surprisingly, Microsoft Corp. and Novell, Inc. have been among the most active companies making Web/Java/intranet announcements.

Novell has embraced Sun Microsystems, Inc.'s Java so fervently that one product manager referred to an upcoming release as JavaWare.

Rather ambitiously, Novell is promising its Java Software Developer's Kit (JSDK) in beta by the end of this year, along with a NetWare Loadable Module implementation of the Java Virtual Machine. The company is also working closely with Sun to produce the Java security and management APIs, hoping to implement them in the JSDK by year-end.

Further out, Novell may add the Java Virtual Machine to its Client32 connectivity software or develop a Java client as a replacement for Client32 on all windowed platforms.

There's even talk of somehow combining Novell's embedded systems version of NetWare with the JavaOS announced by Sun, enabling personal digital assistants and other devices to act as NetWare clients.

Microsoft, while not exactly embracing Java, still wants to be your intranet and Internet software provider.

At this point, Microsoft appears to be out to kill off Netscape Communications Corp. as a viable competitor by concentrating a large amount of research and development dollars in Internet Explorer, its free browser. Word is that an interim release of Windows 95, dubbed Nashville and due late this year, will also include a Web browser.



Dave Kearns

As a network administrator, a Java-enabled NOS and desktop makes sense. Provided the Java security API is strong enough, it means that you would have the ability to manage your network from any platform in any location using the same look and feel — any desktop, anywhere.

There is one fly in the ointment, though. Microsoft's stated intent of wrapping Java inside ActiveX means a long delay in bringing this vision to reality. Microsoft won't have anything Java related until late 1997, and then, most likely, only for the Windows 95 and Windows NT desktop. Although ActiveX is being ported to other desktop operating systems, it could be late 1998 before we see products.

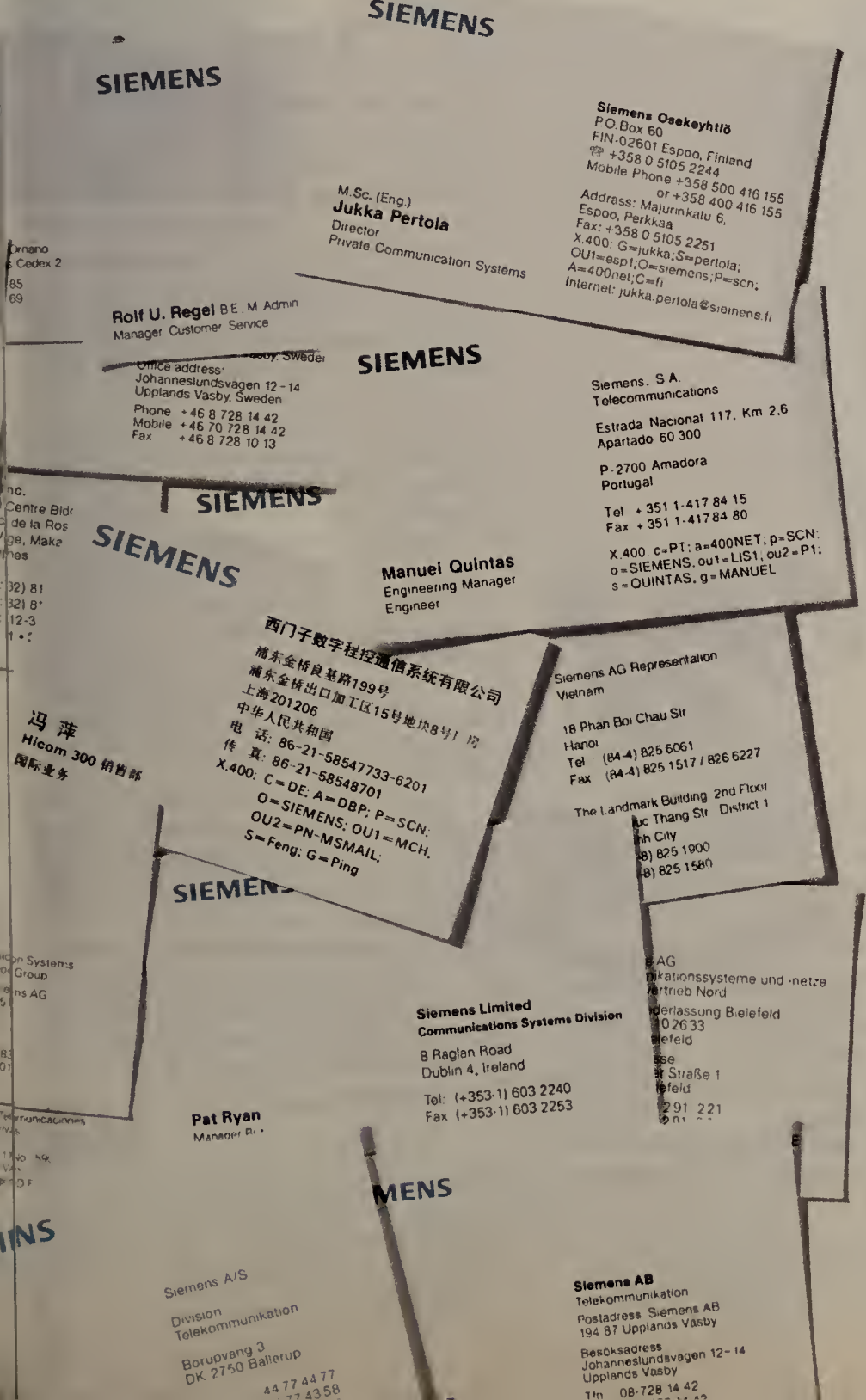
On the one hand, Microsoft wants to kill off Netscape by giving away Internet Explorer. On the other hand, Microsoft gives Netscape a major boost by not incorporating the Java Virtual Machine into its products.

Tip of the week

If you want to see how Java could be incorporated in ActiveX, you'll want to check out CafeOle from V_Graph, Inc. CafeOle is an OCX control, which can be used in most 32-bit Windows development languages. Look for V_Graph's Web site at http://www.v-graph.com/news.html. While you're there, sign up as a beta tester.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

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NET RESULTS

Your vendor as the buyer and what it means to you

On the internetworking market, if it isn't nailed down, it must be up for sale.

For more proof, see the story on page 27 documenting Cabletron's acquisition of ZeitNet, Inc. and Adaptec, Inc.'s purchase of Cogent Data Technologies, Inc.

How is a network manager supposed to keep up? It isn't easy, but it's important to understand vendors' acquisitions and alliances and how they can affect the products you have installed or are thinking of buying.

We break technology company acquisitions into three models to understand their effect on vendors and customers:

■ **The targeted acquisition** — This is where the vendor acquires a company that concentrates on one specific technology. Typically, the company being bought is a start-up or small firm, and the acquiring company is looking for technology and engineering resources. The goal is to gain a strategic technology while minimizing logistical, administrative and integration issues.

These transactions usually don't necessitate having to accommodate a large installed base or deal with channel conflict.

Cisco Systems, Inc. and 3Com Corp. are classic examples of companies that like to use this acquisition approach.

■ **The merger** — This refers to the uniting of two similarly sized corporations into a much larger one. A merger gives companies the opportunity to take on a new corporate image and mission as well as to pool resources.

To get the most out of such a deal, the companies must endure the logistical, administrative, technical and staffing issues that accompany the consolidation of two distinct corporations. Bay Networks, Inc. was the result of a pure merger and has fared well despite some bumps along the way. Mergers are a high risk/high reward strategy.

■ **The partnership** — Of the three models, the partnership represents the lowest level of investment for the vendor.



Skip MacAskill and Meiinda Le Baron

Partnerships are traditionally formed to provide technology or products that complement the strategic direction and core competencies of one or both vendors.

Such partnerships may entail joint development, OEM agreements, technology integration and co-marketing arrangements.

The goal is to incorporate the new technology with a minimum investment of resources, time and money. Partnerships may not necessarily represent high-priority development and may be the first to get discarded when resources become tight. Examples of partnerships include Cabletron and Fore Systems, Inc. and 3Com and IBM.

Due to the market convergence, what was once a single-vendor solution may now incorporate multiple vendors' products through partnerships, mergers or acquisitions.

When selecting a vendor, inquire into any partnerships and acquisitions that vendor has made. Get details on each relationship, including how it was structured and the expected benefits to each party, including you.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached at inquiry@gartner.com or at (203) 316-1111.

INTRODUCING TOPSPIN. THE EASIEST WAY TO GET CDS OVER THE NET.



The new TapSpin™ CD-ROM server is an independent file server providing shared CD-ROM drive access to network users. It installs and automatically configures to any NetWare, NFS or Web environment in less than a minute.

In fact, only TopSpin simultaneously supports all three file systems and up to seven CD-ROM drives. And it does so without using your existing server or workstation resources—so you can plug and play without shutting down your network.

yes It runs with NetWare

The default settings allow instant access for NetWare users, who see TopSpin as a NetWare server.

For NFS users, who see it as a remote server, just give TopSpin an IP address. No client software or special drivers are required.

Web users see it as a Web server and can browse and retrieve contents from any disc. TopSpin even supports hypertext links from other Web servers.

And management is easy because TopSpin can be fully managed from a Web browser, an SNMP management station, a console, or using TopView,™ our intuitive Windows-based manager.

By keeping CD-ROM data on the appropriate LAN segment, TopSpin helps minimize your network traffic. And you can add multiple TopSpin servers to any segment.

TopSpin is also available in a board-level version for integration into towers. There is no per user license fee for either version. Of course, you retain complete control over access thanks to the programmable access security features.

Only TopSpin is plug and play simple.

TopSpin is simply the easiest, most complete CD-ROM server available. And at only $795,* it's also the most affordable.

To order or get our white paper, "Introduction to CD-ROM Networking," call **1-800-894-0519** today. And see how easy it is to get CDs over the net.

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Briefs

■ **Red Brick Systems, Inc.** *of Los Gatos, Calif., this week will announce plans to integrate* **DataMind Corp.'s** *data analysis software into its* **data warehouse** *product. DataMind makes data mining tools, which sift through mounds of data to uncover hidden patterns and relationships, and to predict future results. The DataMind software, along with a graphical user interface-builder tool set, will be available by year-end. Pricing has not been set.*

Red Brick also unveiled a data warehouse database for the IBM RISC System/6000 Scalable PowerParallel 2 computer.

Red Brick: (800) 777-2585.

■ **Tibco, Inc.** *of Palo Alto, Calif., announced a version of its communications middleware that will support* **Java** *applications. The message-based Rendezvous software includes an API to interconnect applications and is based on a publish-and-subscribe technique that transmits changes occurring in one application to all others that have registered interest in those changes. A new class library extends Rendezvous to Java applications. The beta software can be downloaded free (http://www.tibco.com) and will ship by year-end. Pricing has not been set.*

Tibco: (415) 325-1025.

■ **FlexiInternational Software, Inc.** *of Shelton, Conn., has released FlexiWorkFlow, a set of programs for automatically routing financial management work processes throughout an organization. The programs, called templates, work with FlexiInternational's line of Windows-based* **financial management applications.** *A separate tool kit can be used by developers to build new workflow processes.*

A complete set of templates costs $10,000; the tool kit costs $20,000. Templates for the control, purchasing and accounts payable applications are available now.

FlexiInternational: (203) 925-3040.

Object brokers are getting ready to deliver

By John Cox
San Diego

Most customers are not ready to go all-out with object request broker (ORB) deployment, but beta tests are showing the technology's potential.

Expersoft Corp.'s new PowerBroker CORBAplus offering, for example, is being tested by one customer as the basis for a new pay-TV application.

ORBs are the communications plumbing for object-oriented applications running over a network. CORBAplus conforms to the Object Management Group's Common Object Request Broker Architecture 2.0., which outlines a set of distributed services and a common protocol to let different ORBs work together.

Expersoft added several features, hence the "plus" in its product name. CORBAplus includes a technique for letting desktop objects based on Microsoft Corp.'s OLE/Common Object Model (OLE/COM) standard work with CORBA objects on a server. In addition, it supports asynchronous communications.

Systems integrator Alta Software, Inc. of Reston, Va., is the company that has been working with CORBAplus beta code to build a prototype pay-TV subscription application. The Windows NT-based client application, actually a set of C++ objects, is designed for a customer service staffer taking orders and updating customer accounts.

Through CORBAplus, these desktop objects connect to business objects that were also written in C++ and stored on an NT server. Alta developers also tried to connect CORBAplus with a different CORBA broker.

Results were mixed. According to Dave Diehl, senior software developer at Alta, the asynchronous communications method was a "very useful option" because it let end users activate server objects but continue to work locally while the server processing ran on its own.

However, the developers failed to get the two different ORBs to work together using the CORBA Internet Interoperability Protocol, Diehl said.

The Alta developers are not yet working with OLE/COM objects, preferring instead pure C++ objects for the client desktop. The OLE/CORBA interoperability is "a little premature," said Roy Schulte, vice president for systems software architecture at market research firm Gartner Group, Inc. in Stamford, Conn. "Most people are not doing much with OLE yet [in a networked environment]."

Still unsettled is how well CORBAplus, and indeed any of the newest object brokers, can handle big or fast-growing applications. Schulte predicts it will take approximately three years for these products to achieve good scalability. ■

EXPERSOFT'S POWERBROKER CORBAPLUS

What it is: Software that connects objects across a network.

What's new: Full support for CORBA 2.0 standard services and interoperability; links OLE desktop objects with CORBA server objects; asynchronous operation lets local program run while remote objects service request.

Availability: Now for C++ and Smalltalk on Windows 95, Windows NT and Unix machines.

Price: Development licenses start at $2,995; run-times at $50.

Get more Info on Network World Fusion, Including:
- A tutorial on distributed objects
- A look at a proposed Industry specification for OLE/CORBA interoperability
- Details of Microsoft's distributed object strategy

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NeoVista lets users dig into data warehouses

By John Cox

NeoVista Solutions, Inc. this week will launch a set of software products designed to let corporate developers create data mining applications for digging out information from enterprise-wide data warehouses.

The Decision Series from NeoVista — formerly MasPar Computer Corp. — includes a set of specialized data analysis tools for uncovering hidden patterns in data and a layer of data access software for transforming relational data into formats the tools can use. This layer is vital, company officials said, in helping MIS groups to apply the advanced data mining tools to their networked data infrastructure.

Initially, NeoVista is rolling out four data analysis tools with varied functions:

■ The neural network tool can predict events based on past experience.

■ The clustering algorithm finds groups of related items.

■ The genetic algorithm can, for example, create a representative best customer profile from specific customer examples.

■ The association rule system can determine how likely it is that different events will occur at a given time or in a given sequence.

With these tools, users could create a profile of their best customer, then sift through third-party databases with that profile to find possible new customers. The tools could also be used to analyze which of a user's existing customers are most likely to defect to a rival and why.

The second part of the product line, DecisionAccess, includes a scripting language and various routines for transforming relational database categories, such as age, into formats that the analysis tools can use. The tools could be used to break the age category into more specific groups.

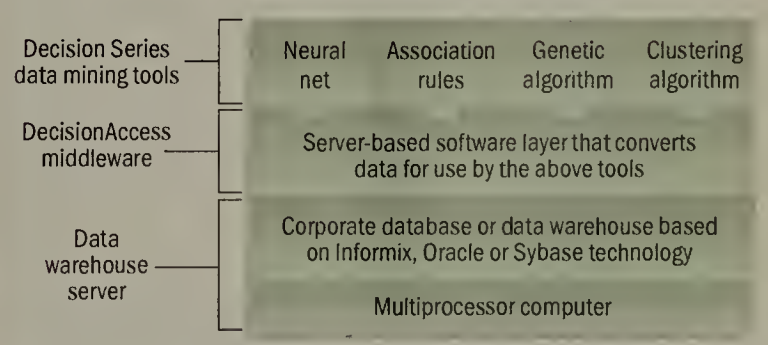
Building applications that can use these advanced products remains complex, so NeoVista's package includes a consultant who works at the customer site to help build and deploy live applications. Eventually, NeoVista will add a graphical interface for the Decision Series products and create a line of ready-to-use applications based on them.

The products will be available by September; first on the Hewlett-Packard Co. HP9000 line of multiprocessor computers and later for Sun Microsystems, Inc. and Digital Equipment Corp. multiprocessor systems. Pricing starts at $45,000 for the suite and can climb to $500,000, depending on the server configuration and number of tools purchased.

©NeoVista: (408) 777-2929.

How NeoVista's products fit in

The company's Decision Series tools let companies analyze the information residing in their data warehouses and uncover hidden patterns.



SHARED LOGIC

LDAP is coming to the rescue

Netscape Communications Corp. is helping to make the dream of an integrated corporate directory more of a reality.

The company is leading a movement to support RFC 1777, a proposed Internet standard for the Lightweight Directory Access Protocol (LDAP). Joining Netscape are 40 vendors, including IBM and Novell, Inc.

LDAP is a protocol for accessing online directory services over TCP/IP. It can be used to access a stand-alone directory or a full X.500-compliant directory.

For years, we've heard customers talk up best-of-breed products, but seen them buy lowest common denominator offerings. One reason for this paradox is that while some products interoperate using standards, they typically require proprietary directory and management functions.

For example, customers can make electronic mail system A talk to E-mail system B transparently through the Simple Mail Transfer Protocol or X.400, but they still have to worry about exchanging directory information.

But what if all the products I mentioned supported LDAP? What if you could just drop a mail server into the network and point it straight at a single corporate directory? And then, whenever you add a new mailbox to the server, it simply updates the corporate directory with the E-mail address? No more redundant data stores just for E-mail addresses. No more complicated directory synchronization software.

Based on information my company recently collected from nine major messaging vendors, everyone who's anyone will support LDAP somewhere in their product line by the first half of 1997. But users will still need to push the vendors to build LDAP everywhere — right onto the messaging client and straight into the messaging server.

Once LDAP is available, users still have to reckon with a few design points. For instance, each LDAP server needs to know where it is in the corporate namespace and perhaps even the global X.500 namespace in order to share E-mail addresses and security certificates with the outside world.



Daniel Blum

Each LDAP server also should be set up to refer clients to a real X.500 Directory System Agent if it doesn't itself incorporate full X.500 functionality.

You'll need to consider human factors, too. Decide whether to expose the full X.500 name to end users, or use one unique attribute such as an E-mail address as the handle for each record. Do some modeling to develop record schemas for employee data and any other objects you want to make accessible through LDAP. Finally, set up a common key field that can cross-correlate employee or other data that overlaps more than one database.

There are a few other issues as well. For example, how does an application find its friendly neighborhood LDAP server? How does an LDAP client authenticate itself securely to the server? Fortunately, Netscape and others are coming up with creative solutions such as proposed standards for putting LDAP pointers into the Internet Domain Name System and running LDAP over the Secure Sockets Layer.

While not yet a panacea, LDAP begins to push some classical messaging integration problems up another level. As a mix of new and established messaging and network operating system vendors begin to integrate directory information on a level playing field, expect even more innovation.

Blum is a principal at Rapport Communication, a consultancy that focuses on messaging, groupware and electronic commerce. He can be reached at dblum@interramp.com.

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Circle Reader Service #46

Special Focus

GROUPWARE

Grappling with groupware interoperability

By Barb Cole

It wasn't all that long ago that electronic messaging systems had a hard time talking to each other, recalls Mark Smith, manager of the Intel Corp. enterprise server group's messaging program in Hillsboro, Ore. Fortunately, much has changed over the past few years and now most E-mail systems interoperate across standard backbones and gateways.

But, of course, that isn't good enough anymore.

"The next step is groupware interoperability, which includes things like calendaring, scheduling and forms," Smith said.

Industry observers agree that groupware interoperability is desirable but challenging, given that it involves forging links among a series of applications.

E-mail interoperability was comparatively simple because it basically involved a single application.

What's more, popular groupware packages, such as Lotus Development Corp. Notes, Microsoft Corp. Exchange and Novell, Inc. GroupWise, each provide different views of data and application development capabilities.

"We're pretty much in a proprietary world when it comes to groupware, but there are a number of emerging standards that will provide lowest common denominator interoperability among these systems," said Matt Cain, an analyst at META Group, Inc. in Stamford, Conn.

Help is on the way

Vendors are cooperating to develop a calendaring and scheduling API for passing information across groupware products and are devising workflow interoperability standards.

In addition, groupware vendors are prepping an interoperability demonstration at an upcoming industry event (see story).

And thanks to widespread support for Microsoft's Messaging Application Programming Interface (MAPI), customers already can mix and match groupware clients and servers. However, in most cases, MAPI exposes only the basic messaging component of groupware.

Most of the major groupware vendors also offer some migration tools for moving E-mail messages into their groupware products.

Exchange goes a bit further than other products in that it offers the ability to share calendars with Microsoft Mail and IBM Professional Office System (PROFS).

But in terms of doing things such as synchronizing discussion databases, "we largely look to third-party developers to provide these tools," said Greg Lobdell, group product manager for Exchange.

Indeed, the lack of interoperability between groupware products has spawned a growing crop of third-party vendors specializing in the field (see graphic).

The movement toward HTML as a native data type will also make it easier to build tools that let users share folders and information between groupware tools, Lobdell said.

In addition, Microsoft will add support in Exchange for its Open Database Connectivity (ODBC) specification later this year, which will let developers move data into relational databases or between other ODBC-compliant groupware systems such as Notes.

For its part, Lotus makes Notes data accessible via the Notes API, Notes Data Access Tools for Windows and ODBC. In addition, Notes includes a field extraction utility called Fx that can be used to export Notes data to other groupware applications.

Novell's GroupWise 5, which is still in beta testing, will support MAPI and be accessible through a series of APIs.

While such features offer developers programmatic access to the groupware platforms, they do not really bridge disparate systems for end users.

"Any interoperability is forged in one of two ways: Two vendors get together and build a bridge, or industry standards emerge," said Andrew Mahon, manager of Internet marketing at Lotus.

Lotus is looking at 'Net standards to provide interoperability with other groupware platforms, Mahon said. If customer demand is there, he said, the company will consider direct links to competing products.

'Net standards emerge

In the short term, analysts said 'Net standards hold the most promise for enabling groupware systems to interact.

These include the X.500-like Lightweight Directory Access Protocol for directory synchronization that has garnered support from more than 40 industry players.

In addition, 'Net News Transfer Protocol is emerging as a standard for accessing Internet threaded discussions from groupware systems.

The cross-platform nature of Web browsers is already eliminating the need for companies to standardize on a groupware client platform. The E-mail components of most groupware offerings support the Simple Mail Transfer Protocol — the native 'Net mail protocol that has gone a long way toward standardizing E-mail.

Even when Web hooks to groupware are universal, they will not solve all the problems of maintaining multiple systems, said Daniel Blum, a principal at market research firm Rapport Communication. "Functionality will be uneven, and management won't be there."

In addition, "Web browsers won't present as good an interface as some mail clients," he said.

However, Web hooks are better than the lack of interoperability among groupware systems that has prevailed, he said. Still, the reality is that, today, many companies are not successfully integrating mixed groupware platforms.

"We're not really solving the interoperability issue; we're avoiding it," said one messaging manager at a large pharmaceutical firm who asked for anonymity. The company supports only Windows as a client platform, and is migrating about 10,000 users from several legacy mail systems to a Microsoft Exchange and intranet backbone.

"Our focus is now on interoperability between Exchange and our intranet," he said. The goal is to publish information from Exchange public folders, put them on the corporate intranet, and navigate between the Exchange front end and an assortment of intranet applications.

"If our users say they want Notes, we tell them they can do the same things with Exchange," he said. ■

A sampling of groupware interoperability tools

Product	Company	What it does	Pricing
EXM/Forum	Enterprise Solutions (818) 597-8943	Bulletin board software that allows users to access other Windows applications, including E-mail systems, without having to exit a forum.	$40 per user
GoldMine	GoldMine Software (310) 454-6800	Contact management software that can be used to send Microsoft Mail and Lotus cc:Mail, and send and receive Internet mail.	$295 per user
JumpStart	MESA Group (617) 964-7400	Synchronizes Notes databases and Exchange folders via replication.	Not available
LinkAge Software	Linkage Directory Exchange (613) 594-9244	Software that lets users customize rules for mapping one E-mail directory to another; it supports Lotus cc:Mail and Notes, Microsoft Mail and Exchange, HP OpenMail, IBM OfficeVision, X.500 directories and Verimation Memo.	Starts at $25,000
MS:Link	Retarus Network Services (800) 627-7681	A gateway that links Microsoft Mail and Lotus cc:Mail users.	$1,295 for a five-user license

Vendors to put on a show

Groupware vendors have done little to make their products work together, but that is about to change.

Eight companies — AT&T, Hewlett-Packard Co., Intel Corp., Lotus Development Corp., MCI Communications Corp., Microsoft Corp., Netscape Communications Corp. and Novell, Inc. — are gearing up for a groupware interoperability demonstration.

The demonstration will be part of an Electronic Messaging Association (EMA)-sponsored event dubbed Solutions Summit: Messaging and Intranet Integration, which will be held in Santa Clara, Calif., on Sept. 24-27.

Officials at EMA said event specifics are still being finalized, but the vendors are expected to walk through the creation of a virtual corporation using their wares.

To date, the interoperability strategies of the major groupware vendors have generally involved supporting one another's Messaging Application Programming Interface-based mail clients and establishing World-Wide Web hooks.

— Barb Cole

HOW TO DEAL WITH MIXED GROUPWARE AND MESSAGING SYSTEMS

- **Install** a messaging backbone that supports World-Wide Web access, Post Office Protocol 3, Internet Mail Access Protocol 4 and Lightweight Directory Access Protocol.
- **Set** a messaging client strategy and stick with it. Clients should support Microsoft's Messaging API and a variety of applications, including E-mail, groupware, Web access and scheduling.
- **Don't** skimp on the infrastructure, including directory services, messaging backbone products, the underlying network and network support.
- **Install** an X.500 or X.500-like directory.
- **Use** products that support industry-standard encryption and authentication technology.



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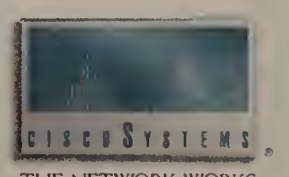
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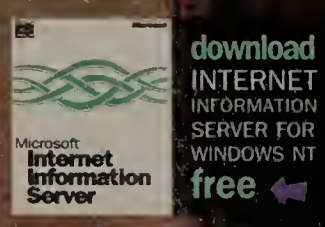
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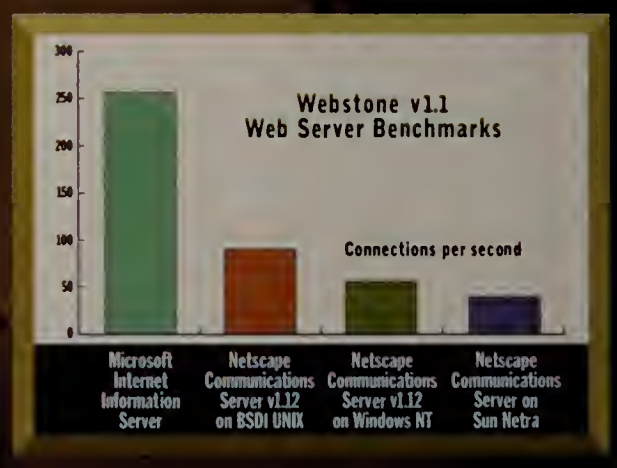
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A Network World Supplement June 1996

IntraNet magazine

Intranets and the new IT

Brace yourself — the intranet cyclone is blowing the top off of stodgy information control practices.

Also inside

- Freebie Web servers
- Review: Netscape's FastTrack
- Schlumberger: powered by intranets
- It's not just a browser anymore


Microsoft
TODAY!

Will the Internet bring an end to business computing as we know it?

Not at all. It will simply knock down the walls between people, between departments — even between companies.

The promise of the Internet, while intoxicating to some, is threatening to others. Because along with the unlimited access and opportunity it provides, comes the need for new strategies and new technologies. Happily, those who've begun the transition to client-server already have much of what they need in place. And to help businesses incorporate the Internet and intranet into their operations, Microsoft is integrating the necessary technology into many of its products — from desktop to server to tools.

For example, it's never been easier to connect desktops to the Internet. That's because both Microsoft® Windows® 95 and Windows NT® Workstation operating systems have all the "plumbing" built right in. Viewing content is just as effortless. With Microsoft Internet Explorer, users can browse the Internet (or internal corporate webs) whether they're working on the Windows platform or on the Macintosh.™

Of course, making web content easy to view is only the beginning. To be useful to organizations, content has to be easy to create, too. Which is why the latest generation of Microsoft Office applications, along with Internet Assistants, allow users to develop web content without programming. They simply save their work as HTML, the way they would any other document. Such ease-of-use also extends to the newest member of the Microsoft Office family, the Microsoft FrontPage™ web authoring tool, which lets users create and manage entire web sites, even if they've never so much as programmed a VCR.

The Internet is very much a part of our BackOffice™ family, too. With Microsoft Internet Information Server, we've extended the performance of Windows NT Server to make the ideal Internet platform. Now every organization can host and manage web content and applications securely and reliably. And, with Microsoft Exchange Server, secure and reliable e-mail is also a reality, whether it's traveling over the Internet or within your organization.

The truly interactive web page has arrived as well...and with it, full motion video, audio and moving text. Advances made possible by technologies like ActiveX™ controls, which let developers embed sound, video, and applications without having to learn new languages.

Yes, the walls are coming down, but it's not the end of business computing. Just the next, most practical evolution.

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INSIDE

IntraNet magazine

June 1996
Volume 1, Number 1

FEATURES

20 **IntraView: Novell's Vic Langford on the intranet promise**
Novell wants to have as big a presence in intranets as it does in LANs. But just how well positioned is Novell to cash in on this trend? We grill Vic Langford, who heads the company's recently formed Internet/Intranet Business Unit, in this special Q&A.

Cover:

32 **The intranet cyclone and the new IT**
In ways not seen since the advent of the microcomputer nearly two decades ago, intranets are fundamentally changing the way corporations handle and distribute information. And this time IT hasn't been caught napping.

35 **From ground zero**
Love the concept of intranets but don't know where to start? Tackle the basics in this primer.

40 **Intranets mean business at Schlumberger**
While intranets are still in their infancy, it is hard to remember life without one at oil field services company Schlumberger, company executives say.

43 **It's not just a browser anymore**
Guess what: All that hype about Web browsers serving as universal clients turns out to be true. With a bit of imagination, a little tweaking and some commercial add-on software, browsers can easily serve as interfaces to a multitude of applications.



David Sims, technical manager of Schlumberger's intranet

DEPARTMENTS

7 **Hot Links**
Your virtual connection to news bits, opinion, insight, humor and other marginalia from planet intranet.

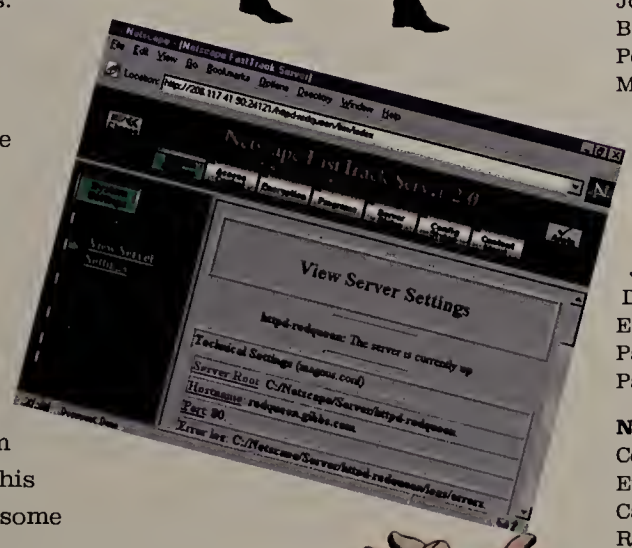
10 **Ask Dr. IntraNet**
In this issue: How do I connect a database to an intranet? If I build a private Web, do I still need traditional client/server applications?

10 **IntraNet Handbook**
Nothing wrong with freebie Web servers. Web servers available free from the Internet are worth a look, particularly if you don't have much of a budget or you have a strong support team.

24 **Product Watch**
With NetWorld+Interop and Internet World behind us, it's time to sort through the heaps of intranet product announcements.

50 **IntraVert**
Dealing with terror. *By Mark Gibbs*
Watch out. As your intranet grows larger, it will drive you rather than you driving it.





REVIEW

15 **Netscape's FastTrack a bit undercooked**
Netscape's FastTrack Web server, which is designed to provide rich functionality while requiring minimum expertise to set up and maintain, is a noble idea. But this almost-ready-for-prime-time product is still in need of some fine-tuning at this stage of development.

Intranet Magazine is a supplement to *Network World*, the leading newsweekly for enterprise network executives. *Network World* is published by International Data Group of Boston. *Network World*, 161 Worcester Road, Framingham, MA 01701. Phone (508) 875-6400, Fax (508) 820-3467, E-mail nwnews@nww.com.

From the Editor

Welcome to the debut issue of IntraNet Magazine, a monthly Network World supplement designed to help you harness the intranet whirlwind.

Not since the advent of the PC have we seen such rapid and fundamental change tear through the world of information technology. But this time we're prepared. This time we're willing participants from the start. Fighting the PC twister was lesson enough.

Intranets are so compelling because they allow for simple information exchange that is — and this is the important part — driven by the people seeking the information. This pull model saves from the data overload common with the push approach, where information is circulated using E-mail and other tools on the off chance it might interest the people it reaches.

You don't have to look further than the Internet to gauge the appeal of the pull model. But in business environments its even more powerful. Take a look, for example, at how Schlumberger is using its intranet to land business (Site Seeing, page 40).

Couple this pull approach with the fact that low cost Web tools are enabling users to bridge system compatibility gaps that standards bodies never mastered, and you have a few of the forces churning the intranet wind.

In each issue of IntraNet Magazine we will examine technology issues, management issues and study the players, taking a long hard look at new tools and the stability of the suppliers.

Let us know what you think.

John Dix, Editor
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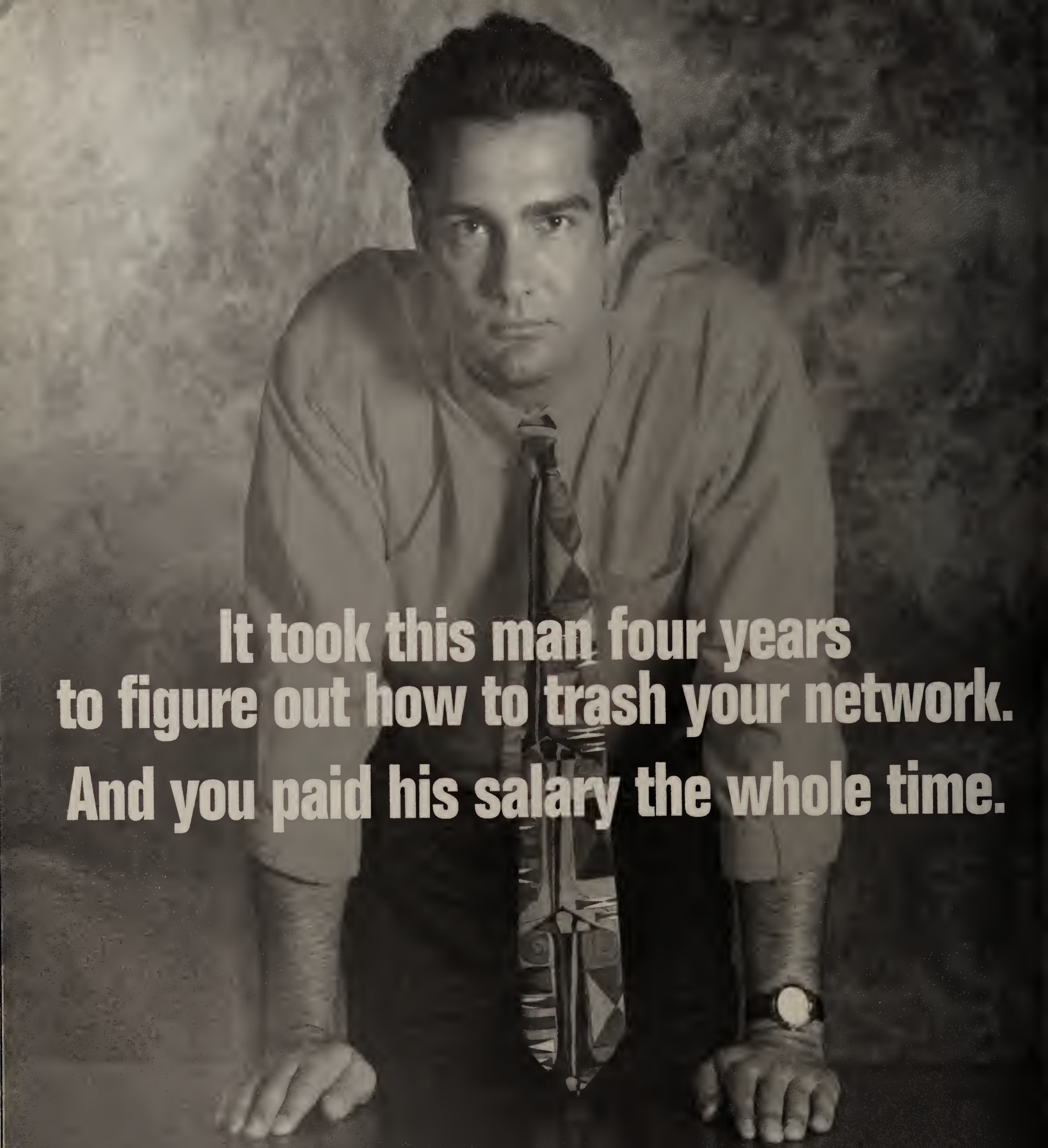
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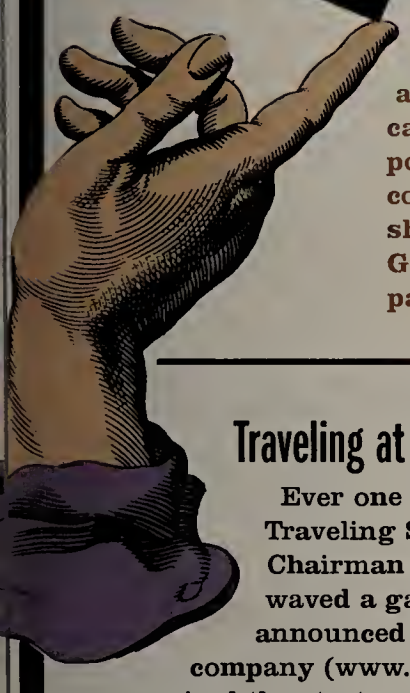
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Opening lines of communication

Dvorak Development's offline newsgroup navigator gets intranet support.

There's nothing like a good newsgroup to pull people together and get them talking about matters near and dear to their hearts.

And nowhere is the idea more powerful than on intranets, where the people communicating are all working for a common cause: the company. Newsgroups may, for example, provide a place where software developers can exchange ideas about projects, or human resources can spell out the nuances of company policies and benefits. Such online communities are powerful things and should be encouraged, suggests Mark Gibbs in his Intravert column (see page 50).

That's why Dvorak Development has enhanced its offline navigator with the ability to set up intranet newsgroups, enabling employees to post documents, pose questions and submit answers.

Dvorak's Offline Usenet Interface (OUI) Version 1.5, which is expected to move out of beta today, is the company's first tool for intranet newsgroups. In addition to this capability, OUI 1.5 lets people view Internet newsgroups from behind a firewall and launch Universal Resource Locators embedded in a posting.

The software requires Microsoft Corp. Windows 3.1, 95 or NT with at least a 386 processor, 4M bytes of RAM and 11M bytes of hard disk space, Dvorak says.

Dvorak offers site licenses and multiple pricing structures. Software for a single PC costs $49, but if a user downloads the open beta from www.dvorak.com and orders the Pro version before June 30, the cost is $29.



The Off-line Usenet Interface lets companies add newsgroups, including ones that add some levity, to their intranets.

Traveling at the speed of milk

Ever one to milk a good line, Traveling Software, Inc. Chairman and CEO Mark Eppley waved a gallon of milk when he announced the Bothell, Wash., company (www.travsoft.com) had acquired the startup software developer Milktruck LLC of San Mateo, Calif.



Traveling Software's Eppley milking the moment

Milktruck markets the offline intranet/Internet Web browser Milktruck Delivery, which automatically retrieves information from user-designated Web sites when data at those sites is updated. Eppley cites the technology as a good fit with Traveling Software's line of remote network access applications.

Milktruck Delivery has been available online in prerelease form, and Traveling Software expects to make general release this month.

"Price? What price? This is the Internet!" joked Eppley when asked for details about the release. However, as his gallon of milk grew warmer, the ebullient software CEO answered another burning query from press: why he shaved his beard.

"The industry is moving faster all the time, right?" Eppley said. "Well, no beard, less wind resistance." He acknowledged "there is a maintenance issue," however.

Industrial buying sprees

The intranet/Internet industry is clearly maturing, evidence of which can be found in the growth of mergers. Recent pairings include the acquisition of Surfwatch Software, Inc. by Spyglass Inc. (www.spyglass.com) for approximately $12.6 million.

Spyglass will incorporate Surfwatch's Internet filtering software (which blocks access to specified Web sites or topics) into its Web Technology Kits, used by corporations to Web-enable products and services..

Earlier this spring, Macromedia, Inc. (www.macromedia.com) acquired Iband, Inc., which markets the Backstage family of visual web site developer tools. The selection dovetails with Macromedia's Shockwave for Director, a browser plug-in user to create and view multimedia on Web pages.

Weaving in a corporate newsfeed

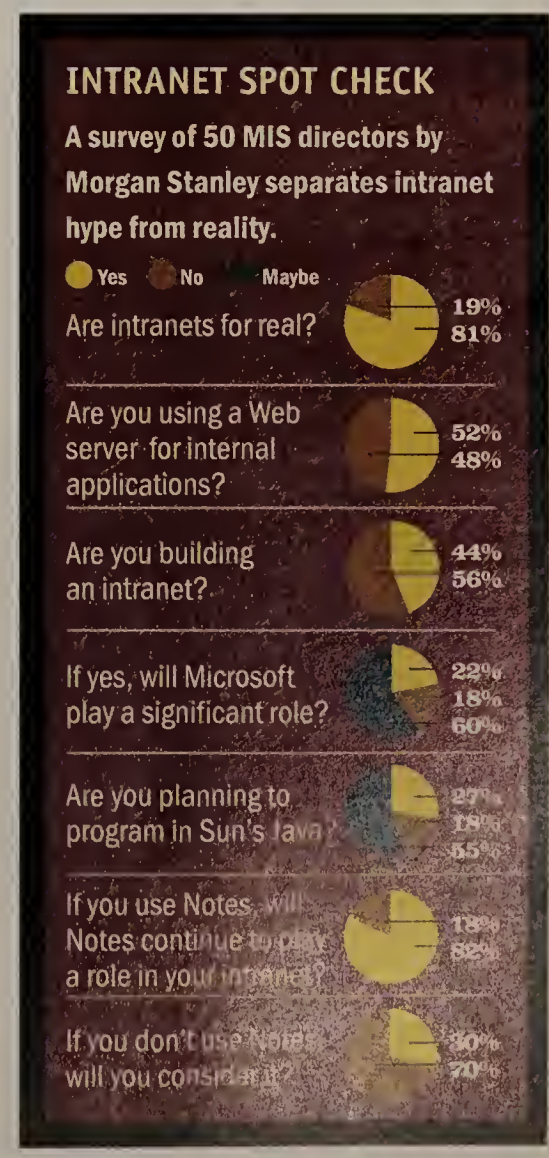
Companies can send in-house news bulletins along with items drawn from the 'Net using new intranet broadcasting tools from PointCast, Inc. (www.pointcast.com).

PointCast's existing service, The PointCast Network (PCN), supplies real-time news and information services to subscribers over the Internet. Users pick custom news sources from a selection of online services, and PointCast broadcasts the data from its Cupertino, Calif., headquarters to subscribers running the PointCast Network client software.

PointCast's new I-Server sits behind the corporate firewall and lets companies splice internal news into the PCN broadcast. Companies can use their private intranet news channels to distribute memos, meeting notices, or information on other corporate events, either selectively or to all subscribers.

Corporate "news directors" can customize the PointCast client interface, and may tailor the information by adding pointers to internal web sites. The concept was dubbed "community casting" by Neil Weintraut, Internet research director for Hambrecht & Quist in San Francisco. He likens it to easing information access to the degree of broadcast television.

PointCast's external channel draws from such sources as Reuters NewsMedia, the PR Newswire, SportsTicker and leading stock indexes, as well as direct connections to sites on the World-Wide Web.



Your virtual connection to newsbits, opinion, insight, humor and other marginalia from planet intranet

hot links

HP, Netscape team up

Building intranets that support existing infrastructure, ranging from hosts down to desktops, is the focus of a new service from Hewlett-Packard Co. (www.hp.com), which will also market and support wares from Netscape Communications Corp. (www.netscape.com).

The companies have teamed to provide intranet consulting services that address E-mail and messaging, Web servers, network management and general connectivity in the enterprise. They are jointly building drivers to link their products, so users can build an intranet by adding a few new pieces of systems or software.



Netscape's Barksdale says the alliance will result in interopeable tool sets.

An early focus is on extending legacy-based internal mail systems to World-Wide Web standards used in intranets, such as TCP/IP or SNMP, so users can get into intranets from existing communications tools. For example, the vendors are making sure HP Open View management software can talk with Netscape Web servers.

"We want to make it easier for a customer with HP OpenMail to use Netscape's Mail Server, and vice versa," said Jim Barksdale, Netscape's president and chief executive officer. Other interoperability tools are in the offing, and the consulting group will also develop links with other vendors' products when warranted.

HP's 4,500 technical consultants worldwide will provide customer support for the new venture.



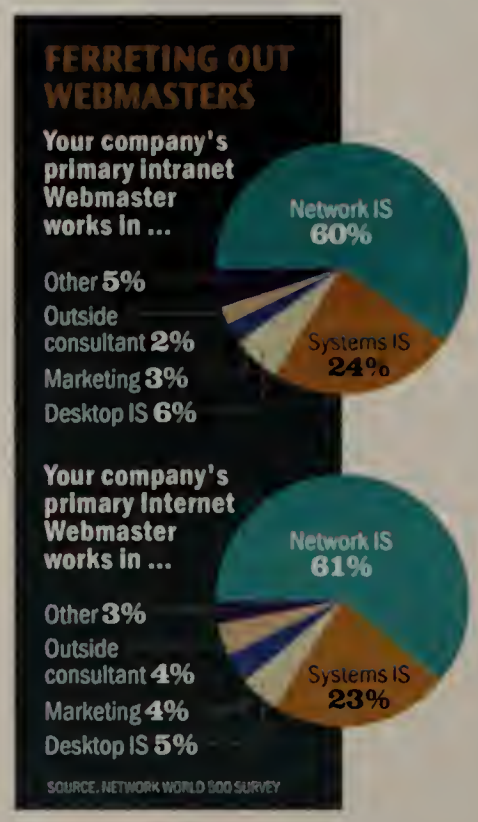
Cloning Andreessen

No, Netscape Communications Corp. hasn't cloned Navigator creator Marc Andreessen, but a two-dimensional Marc spare does hang out by the chief technology officer's desk these days. The pair are visited here by Straton Sclavos, president and chief executive officer of VeriSign, Inc., a neighboring Mountain View, Calif., company that's in the business of ferreting out fakes. VeriSign's Digital ID electronic transaction authentic tion program is marketed jointly with Netscape's SuiteSpot server bundle.

VeriSign immortalized Andreessen on cardboard as a photo prop for thousands of cyber-fans at the recent Spring Internet World '96 in San Jose. The prop posed with the 2D Marc at Netscape's booth. Have programmers achieved the cardboard cutout notoriety usually reserved for film stars or politicians? Andreessen says his 2D self still startles him when he walks into his office. Since he's said to be a bit camera-shy, the clone could come in handy.



VeriSign's Sclavos visits with the, uhh, Andreessens.





Trying on the crown

Microsoft Corp. may get another Netscape headache, as trend-setting intranet/Internet startup Netscape Communications Corp. usurps the bigger firm's usual role as technology standard bearer.

Netscape recently led more than 40 companies and educational institutions in supporting the Lightweight Directory Access Protocol (LDAP) as a proposed open standard for directory services over TCP/IP. Endorsements came from Novell, Inc., IBM, AT&T, Banyan Systems, Inc., Digital Equipment Corp. and a who's who of network vendors.

LDAP is first implemented in Netscape Directory Server, scalable software that provides an enterprisewide directory of users and resources. The protocol supports a hierarchical directory structure and is a subset of the common X.500 standard.

Much of LDAP's development was done at the University of Michigan, which will work with Netscape to extend the technology. Microsoft, meanwhile, has been promoting its own Open Directory Services Interface and reportedly heard the LDAP news along with everyone else, instead of being asked to join the party.

Security at your fingertips

When plain old passwords and user IDs don't seem enough of a safeguard against unauthorized access to corporate Web resources, try fingerprints.

Fingerprint technology has moved out of the crime labs and into the realm of network and information system security. The National Registry, Inc. says the biometric identification systems — a fancy name for finger images — it originally created for government applications can be used for securing intranets and corporate databases.

NRI expects health-care providers and financial-services firms that need to be particularly careful that unauthorized users don't gain access to personal information, will be interested in finger imaging.

To access data, users would prove their identity by pressing their fingertip on a scanner. Workstations running the company's NRIdentity software would capture the image and process it using special algorithms. A back-end server is used for verification and certification.

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a Web server freebie, it's worth checking out the W3C at http://www.w3.org, WebCompare at http://www.webcompare.com/ and ServerWatch at http://www.serverwatch.com.

These Web technology watchers provide links to all of the sites from which you can get to Web server software, free or not. You can download the Web server software from the freeware sites or from many of the Internet file archives by using anonymous file transfer. Be forewarned that file archives may not contain the latest versions and patches, so it's a good idea to check with the originating sites.

In general, freeware Web servers offer all the same features as commercial packages. Even advanced features, such as graphical user interface-based installation and management, real-time performance monitoring and direct database links, aren't things for which you'll have to pay.

If you're so inclined, some freeware Web servers come with source code that you can update and modify. They tend to come with the caveat that the source code be strictly limited to non-commercial use. All other cases are subject to license fees.

Mirroring activity in the commercial market, a growing choice of secure Web servers can be found in the freeware realm. For example, The Apache Group's Apache-SSL-US, Global Network Navigator, Inc.'s GNNserver, IBM Internet Connection Secure and Microsoft IIS free Web servers support Secure Sockets Layer Version 2 software. The IBM Internet Connection Secure server also supports the Secure HyperText Transfer Protocol standard.

What's the hidden cost?

Before you get ready to grab some Web server software off the 'Net, you need to figure out whether free actually means that you don't have to pay for anything, ever. It's advisable to read the licensing terms carefully of any particular freeware Web server in which you're interested.

Some Web servers, such as Netscape's FastTrack and Oracle Corp.'s WebServer, are only free for a limited time. After 60 and 90 days, respectively, you either have to stop using or start paying for the software, these companies say. Servers that carry these kinds of teaser licenses don't really count as freeware.

Some providers restrict use of free servers to non-commercial purposes. So if you're conducting business over your intranet, you may have to pay for a license. These options are still probably worth checking out, however, because the license fee may still be much lower — say about half the cost — than those of commercial products.

Downs and ups

On the downside, freeware Web servers usually come with little or no support. This might be acceptable for experimental use or for casual publishing purposes, but it would not be at all suitable for mission-critical applications unless you have your own experts on staff.

On the upside, getting staff up to speed on the server software is actually doable. On the whole, Web servers aren't that complicated, and many of the freeware systems are extremely well designed. It wouldn't be impossible to get your support staff to a truly expert stage quickly.

Given such a diversity of freeware, perhaps it is not surprising that not-for-charge Web servers are the most popular servers on the Internet.

According to the America Online, Inc. Webcrawler Server Distribution survey dated April 29, around 70% of Internet servers are freeware.

Apache leads the pack with about 35% of those servers; the NCSA follows with a little more than 26%.

It's likely that much the same pattern will develop in the intranet world over the next year. Indeed, given the fierce market battles started by Netscape and escalated by Microsoft, it seems likely that soon users will only have to pay for high-end, mission-critical servers. Freeware Web servers may well be the way of the future. ■



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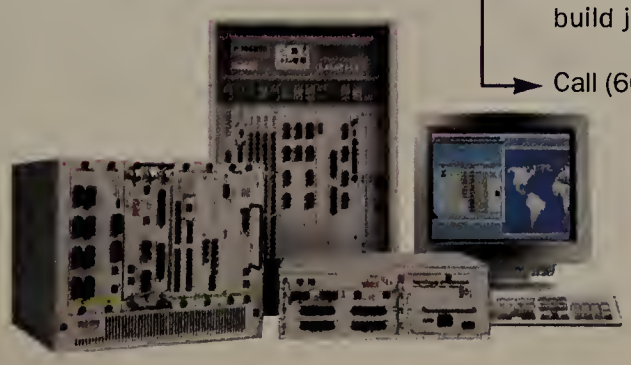
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Netscape's FastTrack:

Engineering and design go 10 rounds



Intranet managers can work with FastTrack tools, such as Server Settings, through the browser interface.

BY MARK GIBBS

Recognizing the need to offer an intranet solution for less technically proficient users, Netscape Communications Corp. has created FastTrack, a Web server designed to provide lots of functionality but requiring a minimum of expertise to set up and maintain.

PRODUCT CAPSULE

Name: Netscape FastTrack Server
Current release: Version 2, Beta 3
Vendor: Netscape Communications Corporation
Address: 501 E. Middlefield Road
Mountain View, CA 94043
Contact information:
Corporate customers: (415) 528-2555
Executive offices: (415) 254-1900
Fax: (415) 528-4124
E-Mail: info@netscape.com
Web: http://home.netscape.com

To see whether Netscape is on track in achieving that goal, we decided to take a look at FastTrack Version 2, Beta 3. We don't usually review beta products, but with FastTrack at a Version 2 level and in public beta test, we felt this almost-ready-for-prime-time product from a leading vendor warranted a look.

To our surprise, we found that FastTrack is, in many respects, a triumph of engineering over design. In short, the product's design goals have been overshadowed by implementation decisions. Fast to install but poorly documented, complicated and resource-hungry, FastTrack is a disappointment at this stage of development.

If you'd like to see for yourself, the current release is available on a free, 90-day evaluation. You can download all 10M to 14M bytes of it (depending on platform) from Netscape's Web site (http://home.netscape.com).

Organization

FastTrack actually consists of two Web servers: one for publishing documents and another that handles server management functions. Once installation is completed, all configuration and management is done through a Web browser. Of course, because the management screens all use frames — a screen layout technique specific to Netscape — and features not generally found in other browsers, you are constrained to using Netscape's Navigator browser.

Practically everything that needs to be done to configure and manage a FastTrack server can be handled through the management interface. The interface requires that you log on with a user name and password that you define during installation. This is to prevent unauthorized changes to your server.

Note that while it is possible to perform all operations remotely from the server, the inherent security risks make it unwise. For example, if the encryption services are not enabled — the default state — your communications with the server could be intercepted, revealing your administrative name and password.

The basic publishing server architecture is standard, with the usual layout of a document root directory, log files and sub-directories for back-end server executables or scripts.

The FastTrack server is designed to support standard scripting languages such as C, C++, Perl, Visual Basic, Java and JavaScript. The latter is supported through a built-in Java interpreter.

Major features

Through the browser interface, you can work with such tools as System Settings, Access Control, Encryption, Programs, Server Status, Config Styles and Content Management.

The first of these, System Settings, offers you a number of functions. One is the ability to start and stop the server, a feature that behaved erratically under Microsoft Corp's Windows NT. I was usually forced to go to the Windows Control Panel application and use the Service Manager to restart the FastTrack Web server.

Other functions that can be handled under System Settings include Network Settings the administrative user name and password, server name, port and so on); custom handling of error responses (allowing you to present, for example, something other than the standard "File not found" message); and Performance Tuning for setting the size of the "listen" queue for incoming request handling.

Server Status offers a number of server log reporting options so you can examine the server's workload and performance data. Curiously, none of the data is displayed graphically. One of the useful features in this group is a real-time server activity display that updates itself about once a second, allowing you to keep an eye on data transfer rates and the number of errors generated.

In all, FastTrack's reporting features are on par with competing products in the market and less impressive than third-party tools.

Most of the other major features are fairly self-explanatory. Those that aren't, such as Config Styles are very poorly explained in this release. Config Styles are the same as Configuration Templates in the Communications Server. They allow you to predefine sets of attributes such as event logging and access control so that files or directories can be easily configured.

Security and encryption

One of the more complex features of FastTrack is the Encryption option. This allows you to enable Secure Sockets Layer (SSL) support to provide a secure and private connection between the server and SSL-enabled clients. In the context of a distributed intranet, this is potentially a very powerful security tool. It prevents spoofing of servers and ensures that clients can be authenticated.

Setting up the authentication system requires that you apply for an authentication certificate, or a digital ID. This is provided, for a fee, by a certification authority (CA) such as Verisign, Inc. of Mountain View, Calif.

Once you have a certificate and have completed the encryption setup, browsers can verify that you are who you claim to be by referring to the CA. This obviously requires that both the server and the browser have Internet access so that they can get validation from the CA.

Integration

FastTrack aims to be a very advanced and comprehensive Web server system. Note that I refer to FastTrack as a system: It offers a range of features that extend the Web server into a full-fledged Web publishing environment.

The key features that make FastTrack's Web publishing services effective are integrated editing and publishing, and server applications management. Using Netscape's Navigator Gold, the

PROS AND CONS

Pros
- Good performance
- Secure server operation under Secure Sockets Layer (SSL) Version 3.0
- Comprehensive management interface
- Java, JavaScript and standard Common Gateway Interface (CGI) support
- Excellent integration with Navigator Gold for HTML document editing and with LiveWire for applications management

Cons
- Clumsy management interface
- Poor documentation at the current release level
- Significant RAM requirement (32M bytes minimum)
- High price

RATING

Value for money	2
Intranet usefulness	4
Quality	3
Overall	**3**

1 is poor and 5 is excellent

SUMMARY: FastTrack offers a range of advanced features but the interface clumsiness, poor documentation and pricing seriously weakens the appeal of the product at this release level.

The above comments apply to FasTrack 2, Beta 3 only. Subsequent releases may substantially change this information.

documents and another for server management.
fasttrack consists of two Web servers: one for publishing
Netscape offers a chat group for users test driving its servers. Go to http://home.netscape.com/communities/netscape-user-groups.html.

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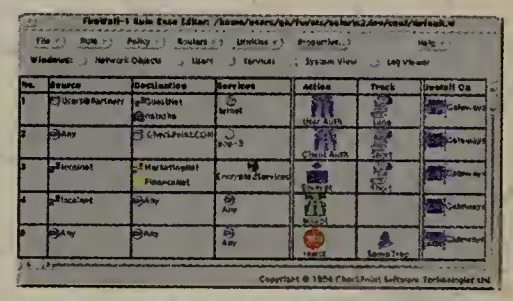
Pletform Support	Unmetched Applicetion Support	Virtuel Privete Network Solution	Fully Configureble Remote Users	Distributed Menagement
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Navigator version with a built-in HTML editor, you can create simple Web pages and then upload them from within the editor to a target FastTrack server.

Back-end server applications management is done with two add-on products, Netscape's LiveWire and LiveWire Pro. These are tools for installing, managing and controlling server scripts and, in the case of LiveWire Pro, providing access to back-end database services, as well. The combination of document editing and applications management integrated with the Web server makes for one of the most sophisticated platform concepts in the market.

Documentation

Frankly, someone at Netscape isn't on the ball here. I have always thought that "beta" meant complete and ready to be tested, but the FastTrack documentation features deathless prose such as, and I quote exactly: "Is there a compelling reason for not calling the server manager the server? No, this heading won't be this long. I'm just too tired to think of an alternative."

It would be unfair to characterize this sloppiness as typical of Netscape's documentation, but it is surprising coming from a leading vendor.

On the plus side, installation is relatively straightforward, but be sure to read the support notices on Netscape's site before starting. For example, if you don't have an accessible Domain Name Server on your network, you will have to jump through a few configuration hoops before you get a clean installation. This is despite the Configuration Wizard feature that's supposed to detect network settings and manage the set up.

Like Netscape's technical support people, I believed it when I read somewhere on its site that FastTrack could be run under Windows NT Advanced Server in 16M bytes of RAM. After literally hours on the telephone with them and numerous reconfigurations, we got it running in 16M bytes, but only after reinstalling with Windows NT Workstation.

"As a suitable and effective choice for intranets, FastTrack has real potential... But in the Beta 3 release, it suffers."

Even then, my system suffered from poor performance when using the administration services, and Netscape was unable to diagnose the problem. These problems subsequently disappeared after I changed the configuration and restarted the server several times.

I suspect that many of my problems were related to having only (!) 16M bytes of RAM. It's likely 16M bytes is a theoretical minimum and FastTrack requires at least 32M bytes (as noted in the FastTrack Data Sheet) if it is to run properly on any of the wide range of platforms supported.

Worse still, according to various testers with whom I have spoken, you would be advised to operate with 64M bytes. Unless this memory requirement is reduced in the final release, FastTrack won't be such a bargain. The cost of RAM is not trivial, and in an intranet with a large number of departmental or workgroup Web servers, it could be a significant constraint.

In performance terms, FastTrack's Web publishing server is impressive, with good service behavior and graceful degradation under load. My problem with the slow response of the management server was most likely a beta issue.

Bottom line

As a suitable and effective choice for intranets, FastTrack has real potential: You get all of the components needed for a sophisticated installation in an integrated system. But in the Beta 3 release we looked at, FastTrack suffers from atrocious documentation and an interface that only a programmer could consider suitable for a low-end product with the word "fast" in it.

Cost-wise, the server is, at first blush, reasonably positioned at a list price of $295. But it's a different story when you add in the other components required for a fully featured system.

As I noted earlier, requiring a minimum of 32M bytes of RAM ups the base cost of using FastTrack. Adding LiveWire or LiveWire Pro will up the price by $199 and $699, respectively, for Windows 95 and Windows NT, and $399 and $899, respectively, for Unix.

In short, Netscape's FastTrack has tremendous potential. It has a breadth of services that is impressive and a level of integration that could make Web server management much easier. But first, FastTrack needs real documentation that is well integrated with the management interface. I'd also like to see more wizard-type help embedded in the management interface, especially in some of the more complex areas such as encryption.

There's hope yet that FastTrack's ambitious design can triumph over engineering. ■

Go to http://www.infoworld.com for FastTrack updates

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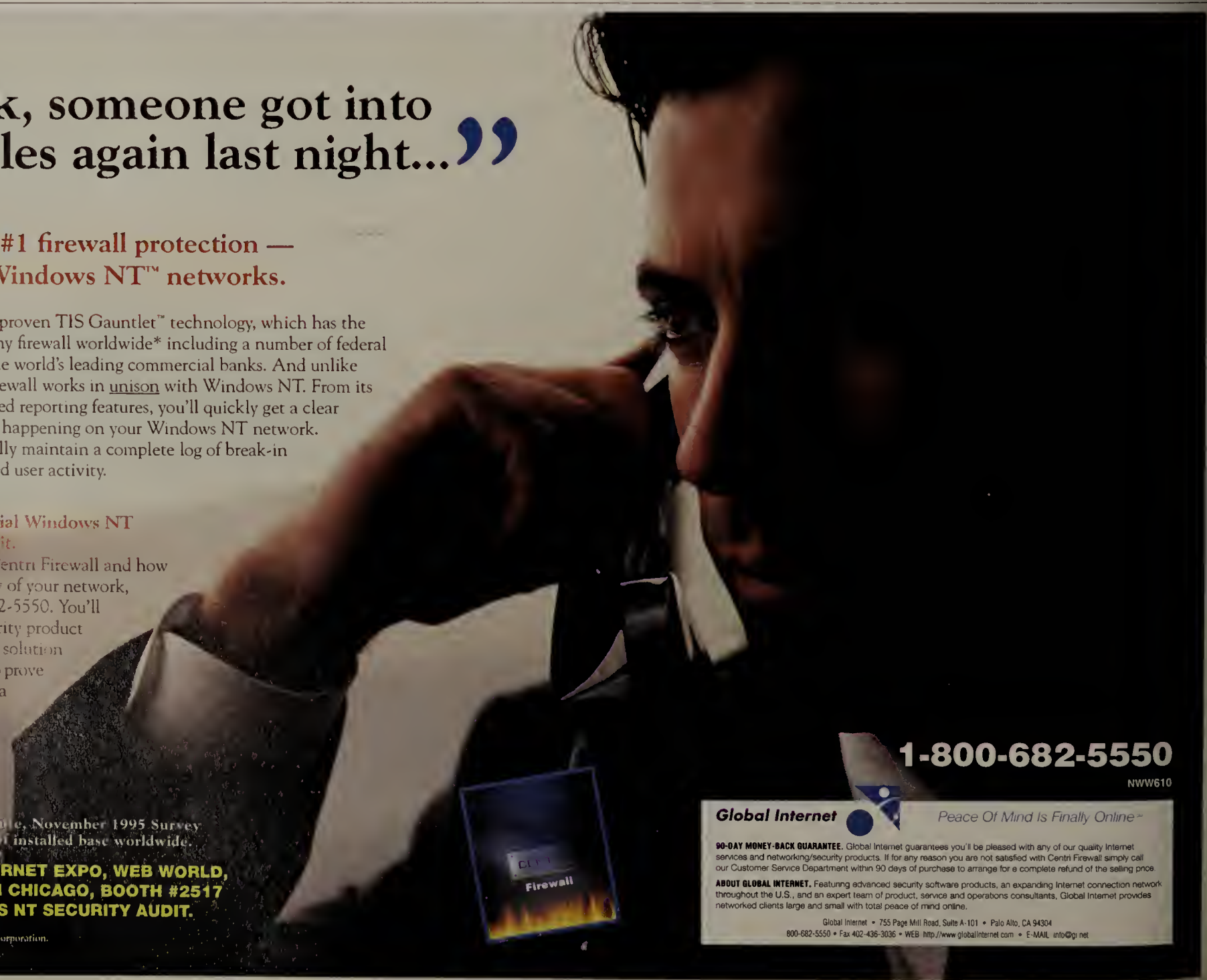
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* Computer Security Institute, November 1995 Survey. TIS Firewalls have 22% of installed base worldwide.

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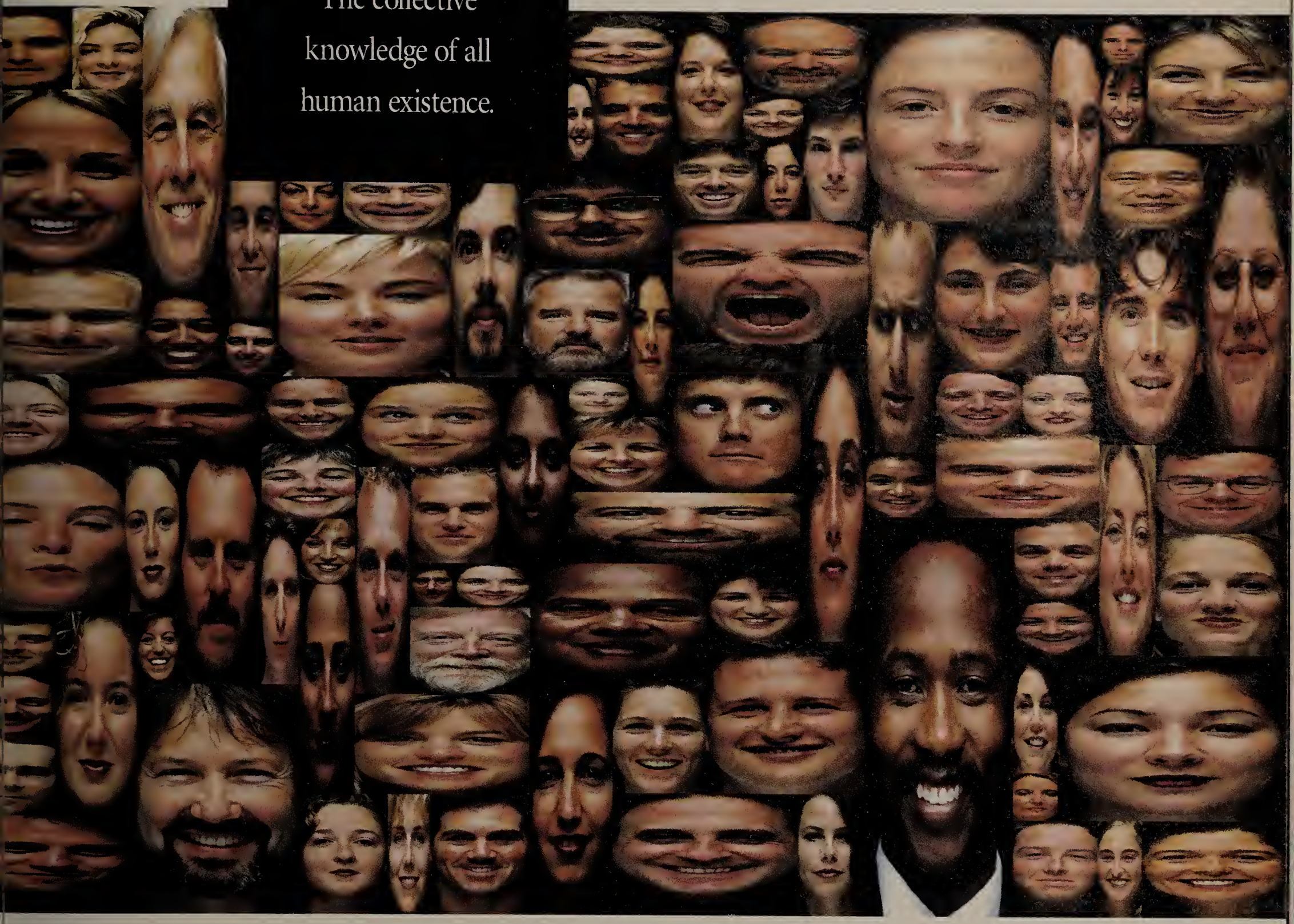
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Lots of companies are hoping to profit from the intranet rush, but if any has a chance to cash in big, it's Novell, Inc. If Novell can help customers transform the huge installed base of NetWare servers — the company still maintains more than 60% market share in network operating systems — into World-Wide Web servers, it can open up wide new revenue opportunities and slow the gains Microsoft Corp.'s Windows NT is making into corporate America.

It's no secret Novell has stumbled in its attempts to branch into new markets, but it is attacking this opportunity with a vengeance. It recently reorganized into three main business groups, one of which is the Internet/Intranet Services Business Unit headed up by Senior Vice President and General Manager Vic Langford. Network World's editor-in-chief, John Gallant, talked with Langford about Novell's intranet plans.

Novell has had multiple strategies in the past several years: to be our Unix company (UnixWare), applications company (WordPerfect), desktop operating system company (DR-DOS), application development company (AppWare). Why should people buy into your Internet/intranet strategy?

I don't believe we've ever said we intended to be a Unix company or desktop operating system company or any other sort of company alone. Those initiatives were elements of an overall strategy to expand beyond our core strengths into other areas.

We realized we were stretching our resources and, when competing in a market as competitive as the networking software business, there is only one way to stay ahead, and that is to focus. So during the past 12 to 18 months we have taken some tough actions to bring us back to our core strength of being a network software company.

The Internet and corporate intranet phenomena is a market trend that displays enormous growth and is core for the networking software business. This is a business that Novell has always been in and something we will always be in. It isn't simply a matter of people being reassured that this is where the focus stays, it is to recognize that this is where we will focus even more.



PHOTOS: STEVE HATHAWAY

Critics would argue the market has passed Novell by. Its main product is a network operating system that isn't the greatest platform for running applications in a distributed environment. They say Microsoft has that market in hand with NT. Do you think tintranets offer Novell a way to shift the playing field and gain an advantage?

I don't believe the market has passed us by. The networking software business is just beginning, and the usefulness of the Internet and corporate intranets is proving that. We haven't even covered the tip of the iceberg, let alone become a saturated market. We've seen a company with no customers and $6 million in venture funding [Netscape] become a major player in less than 24 months. How about a company that has been in the market for 11 years, has 27,000 resellers, 50 million users, $1.5 billion in venture funding and several thousand of the best networking software professionals in the world? It's way too early to count anybody out – especially Novell.

Microsoft calls NT a multipurpose OS. They are trying to make it all things to all people. Inevitably, this means that it is not optimal. NetWare, on the other hand, is a thin operating system designed for networking services and applications, and our customers continue to see its advantages in terms of performance, flexibility and stability. I think the continued trends and growth in the networking software market certainly offer us the opportunity to shift the playing field and extend our advantage.

NT seems to be winning the game, in terms of installation numbers, as the application server of choice in corporate America. Does that mean Microsoft will win in Web servers?

Windows NT is not winning the server game. Microsoft recently released numbers showing how NT was winning. Of course, these were based on internal estimates and [Microsoft] conveniently chose to confuse NT client numbers with NT server numbers. We released a rebuttal that showed that if you look at independent IDC [International Data Corp.] numbers, NetWare continues to maintain its share of the server market. NT has been successful in displacing a number of Unix servers, and we do see pressure from them at the small-network end of our business.

If I rephrase your question to be, 'Will Microsoft win the Web server game because it is on a multipurpose server,' then my answer is no. Why should it? In a distributed client/server network you need the flexibility of distributing your network services and resources. So for performance, reliability and security reasons it makes sense to use a special purpose platform for your Web server.



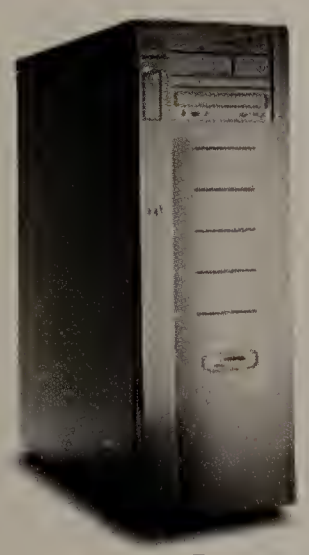
A Web server needs to respond to a request by reading a disk and delivering the file in the fastest time frame, while running on inexpensive hardware and being manageable no matter where it is distributed. Sounds like exactly what NetWare is good at, doesn't it?

If we look further into the future, Web servers will be a conduit for delivering information to users and applications. A very important issue is the management of that information. Novell has

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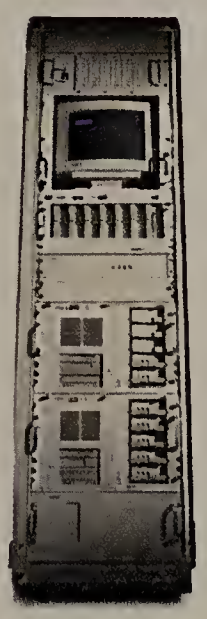
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...distinct advantage in Novell Directory Services, or that NDS offers one location from which to manage the access to information.

Incidentally, I'm not even sure Microsoft wants to win the Web server game. Web servers don't use Windows technology. Web technology is as independent and open as any area in the industry. The Web craze is pulling Microsoft away from Windows, and that takes them away from their position of strength.

What is your browser strategy? Do you care if any particular browser wins?

We will support any of the standard browsers. We include Netscape Navigator with many of our solutions, because it is the most popular browser available. We intend to extend access to all of our services from any standard browser. This is already possible for the Web server, and we have also announced browser access to GroupWise,



including electronic mail, calendaring and other functions — you can even tetract an E-mail message across the Internet using a standard browser.

One key to any company's Internet/intranet strategy is to offer collaborative computing applications on top of the Web server. IBM has Notes; Microsoft has Exchange. Netscape has Collabra. And Novell has GroupWise. We now have almost 6 million users, more than any other groupware product on the market, and are continuing to grow at 75% per year — a growth rate we have seen over the last four years that outpaces all of our competitors.

IBM has Notes – at a cost of $3.5 billion. GroupWise is far easier to install and administer, and because of its tight integration with the network, we can demonstrate proven cost-of-ownership benefits. Of course, Notes also requires a staff of programmers to write applications before any productivity benefit can be realized, so a company must make substantial investments after the initial purchase to even start to get a return on their investment. GroupWise works right out of the box – no programming required.

Microsoft has Exchange, a first-generation product that requires Windows 95 on the desktop and Windows NT on the back end. This shouldn't be a surprise, after all, Microsoft is a Windows company. But if you need a Mac, Unix, Windows 3.1, or an Internet browser in addition to Windows 95 on the desktop, or you want it to work with NetWare 3.X, NetWare 4.X, Unix, or OS/2 in addition to Windows NT on the back end, you might want to consider GroupWise, because Exchange simply won't work., GroupWise is a proven solution, whereas Exchange is not.

I am sometimes amazed that people expect a network solution from a desktop company to have the reliability and scalability they need without an awful lot of growing pains. Did you see the Microsoft 10,000 user simulation at NetWorld+Interop /96 crash while GroupWise was being used in earnest by 80,000 users outside the demo room?

Netscape has Collabra – which of course is a company, not a solution. So while Netscape is starting from scratch, or on a Collabra base that was never proven and had few users, GroupWise users get the benefit of Novell's existing collaborative computing solutions on the Internet and their corporate intranets. Instead of using an E-mail package that cannot even support word wrap, GroupWise users benefit not only from full-function E-mail, but also calendaring and scheduling, document management, task management and workflow as part of their corporate intranet solution.

We are in beta with a major upgrade to GroupWise that we will be releasing late this summer as we promised. Our customers and many analysts are saying that we have a better solution. We believe them.

One key strength for Novell is the directory technology, where rivals such as Microsoft and IBM lag behind. How do you use the directory to your advantage in the Internet/intranet market?

I agree with your statement. We now have more than 15 million NDS users, and we intend to maintain our leadership. We believe that directories will be the point at which security, applications and other services converge to create the distributed computing environment that will change networks as we know them today.

The resources you use in the Internet and in your corporate intranet need organization, and we provide that ability with NDS. We will expand the NDS X.500 foundation to support LDAP [Lightweight Directory Access Protocol], the Internet directory standard, so that our customers can use NDS as the single directory for organizing all their resources. NDS is currently available on NetWare and SCO's [The Santa Cruz Operation's]UnixWare. We will be porting it to Windows NT and other flavors of Unix, thereby solving a problem that Microsoft hasn't been able to solve even with their own products.

One key to making intranets work is providing tools/technologies for integrating Web servers with legacy applications and databases. What will you do to help companies with that task?

We offer local and remote CGI [Common Gateway Interface] today. Local CGI uses standard interfaces to integrate with databases on the same NetWare server. Remote CGI uses standard interfaces to access your Oracle Corp. or other databases on any server in your corporate network, whether it is Unix, Windows NT or NetWare. As well as allowing access to existing corporate databases, this allows off-loading of processing — giving yet another performance advantage for a NetWare Web Server.

We also support PERL and BASIC scripting languages to allow integration with legacy applications. We have also announced support for Java on NetWare and have shown integration of Java applets with our Web Server. In addition, we have now integrated our Web Server with NDS, allowing easy configuration and administration of customers' legacy resources. Through our developer initiative code-named Net2000, we now allow users to develop with tools such as NetBasic, Visual Basic and Java to access Novell's networking services.

What will you do to help companies build secure, transaction-oriented Internet/intranet applications?

At a very basic level, we are certifying NetWare networks to a [U.S. Department of Defense] C2 level of security — not just the server, but the complete network that it serves.

We are a licensee of RSA [Data Security, Inc.] public/private encryption algorithms that are built into all of our solutions. We have announced a relationship with Open Market, Inc. to integrate their SecureLink technology with NetWare, to allow our customers to build storefronts for use on the intranet. This is also an ideal architecture for use in business-to-business commerce.

We are working on offering X.509 certificates, and with a number of companies to tackle the issue of certificate authorities. And of course, we are working on extensions to NDS to organize and pull it all together.

Through our NetWare Connect Services initiative we are also working with service providers to take all of these technologies and combine them with their expertise to offer a business-class Internet solution for TCP/IP- and IPX-based networks.

I don't think customers are clear on just what NetWare Connect Service is. Can you explain the concept and how it fits in with your overall Internet/intranet strategy?

NCS offers a secure, managed environment for business applications. It is ideal for public, virtual private and hybrid data networks. NCS offers businesses an environment where secure networking can take place, making applications and information available across the enterprise and beyond by including partners, suppliers, consultants and customers in [those businesses'] wide-area network.

The service is currently offered by AT&T and will soon be offered by a number of other carriers around the world, including Telstra Corp. in Australia, Deutsche Telekom in Germany and NTT in Japan.

MORE ONLINE

For the full text of this Q&A, go to (http://www.nwfusion.com) on "Intranet Magazine".

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Toning down the roar

BY PEGGY WATT

With NetWorld+Interop and Internet World behind us, it's time to sort through the heaps of intranet-related product announcements spewed forth over the last two months.



The Columbus desktop provides basic internet/intranet access tools, and an activity manager to track and control tasks.

Web servers



Microsoft (www.microsoft.com) continued its thrust with Internet Information Server (IIS), which this month began shipping as part of the BackOffice 2.0 server application family. Previously, the Redmond, Wash., company had been offering IIS free on the Web and bundled with the Windows NT operating system.

Actually, each BackOffice component now has intranet features, says Tanya Van Dam, product manager for the server suite. For example, SQL Server 6.5 offers query conversion between the database and IIS, Exchange Server 4.0 allows collaboration over an intranet and SNA Server 2.11 connects the Web to legacy systems.

BackOffice pricing varies by configuration, but the basic five-user license costs $3,508.

Netscape (www.netscape.com) also is rounding out its own suite of server products, which the company introduced this spring at its first developers' conference. Dubbed SuiteSpot, it includes Enterprise Server 2.0, Catalog Server 1.0, the LiveWire Pro development environment, Proxy Server 2.0, News Server 1.1, and Mail Server 1.1. The suite costs $3,995 for either Unix or Windows NT versions.

Bundling, as Microsoft and Netscape have done with BackOffice and SuiteSpot, is emerging as a Web server marketing necessity. Likewise, support for other Web technologies, such as search engines, Java programs and Microsoft's ActiveX protocols, are part of standard Web server fare. Since few vendors have the singular resources of Microsoft, most companies are partnering to provide combination packages.

Many Web server vendors have turned to Verity, Inc. (www.verity.com) for its Topic search engine. Verity's search functions, for example, are already part of the WebBase Pro server from ExperTelligence, Inc. (www.expertelligence.com).

WebBase Pro also supports the Java and Visual Basic programming languages, as well as a new data interchange function that can conduct nested queries of a database by embedding commands to seek additional or related information, according to Denison Bollay, ExperTelligence president and chief executive officer.

WebBase Pro routes Universal Resource Locators (URL). This feature lets Webmasters capture an Internet site's information and post it from the server of origin onto an intranet, for instance, Bollay says.

WebBase Pro is priced at $4,995 for an unlimited user license.

Other noteworthy news related to server search engines is the release of Fulcrum Technologies, Inc.'s update of Surfboard. This Windows NT-based information-retrieval package can save and reuse queries as search objects created by the user or administrator.

The new release, Surfboard 2.0, provides HyperText Markup Language-based templates to display results and can store indexes on local servers, according to Fulcrum (www.fulcrom.com). The update is priced at $6,250 per server.

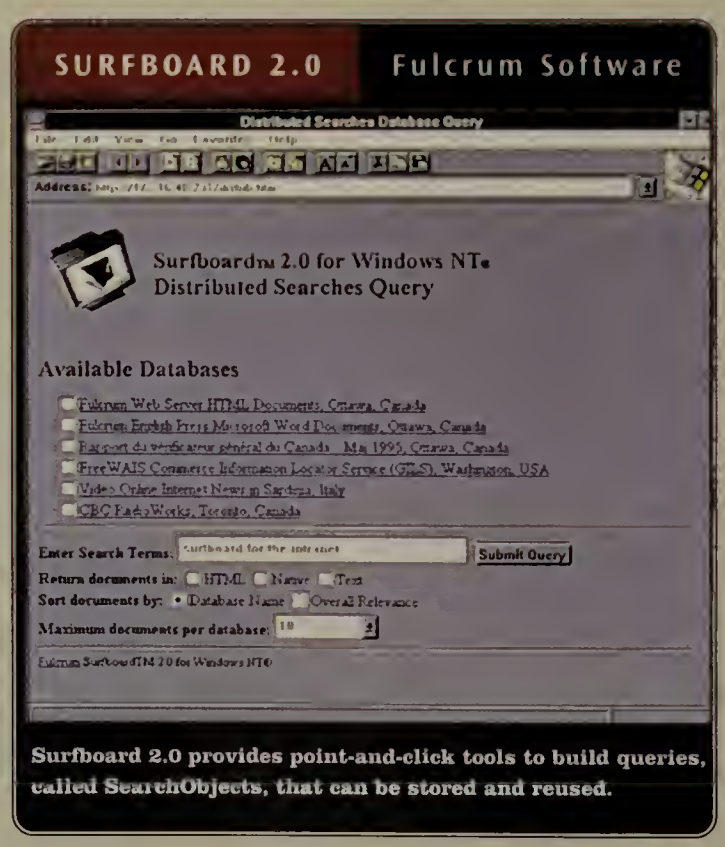
Browsers



Microsoft and Netscape have been active on the client side, too. Netscape pushed version 3.0 of its Navigator browser into beta and is primed for general release this month. Actually, the software already is available for downloading. Version 3.0 is free for 90 days of use for commercial deployments and without restriction to educational institutions. If you want tech support, printed documentation or disks, you'll have to pay.

Highlights of Navigator 3.0 include client authentication, support for Secure Sockets Layer 3.0, Internet phone and whiteboard technology, 3-D representations via Virtual Reality Markup Language 2.0 and live caching.

Navigator Gold 3.0, which will also include Web authoring and editing functions, is scheduled to ship this month. Both browsers will be available for all the Windows platforms, the Apple Computer, Inc. Macintosh MacOS, and several flavors of Unix. Microsoft takes a different approach, focusing first on Windows 95 and Windows NT, then Windows 3.1 and the MacOS.



Surfboard 2.0 provides point-and-click tools to build queries, called SearchObjects, that can be stored and reused.

Navigator 3.0 follows just on the heels of version 2.01, which Netscape began shipping in April. Netscape also promises another update to Navigator by the end of the year, with the feature emphasis on multimedia.

Amid this battle of the giants, the market is bustling with client environments that include browsers that interact with accompanying applications and with add-ons that enhance one or more of the leading products.

Off-line browsers are garnering attention, for example, as users realize just how much time they spend surfing and especially returning to particular sites. For the intranet, an off-time browser can be useful for rote and frequent tasks. Among the recent entries are Frontier Technologies Corp.'s CyberSearch 2.0 and Tympani Development, Inc.'s NetAttache.

Tympani (www.tympani.com) describes NetAttache as a Web agent for browsers. The product, available as freeware downloadable from the company's Web site or as a more hardy commercial version, relies on spiders to periodically check Web sites at the user's specification and save the findings to holding files that also retain the URL.

The commercial NetAttache provides filtering and analysis functions, says Anthony Dias, a Tympani partner. Filtering occurs at the client level, so users can still see previous iterations. NetAttache also can connect to common search engines and request and collect information simultaneously from several indexes.

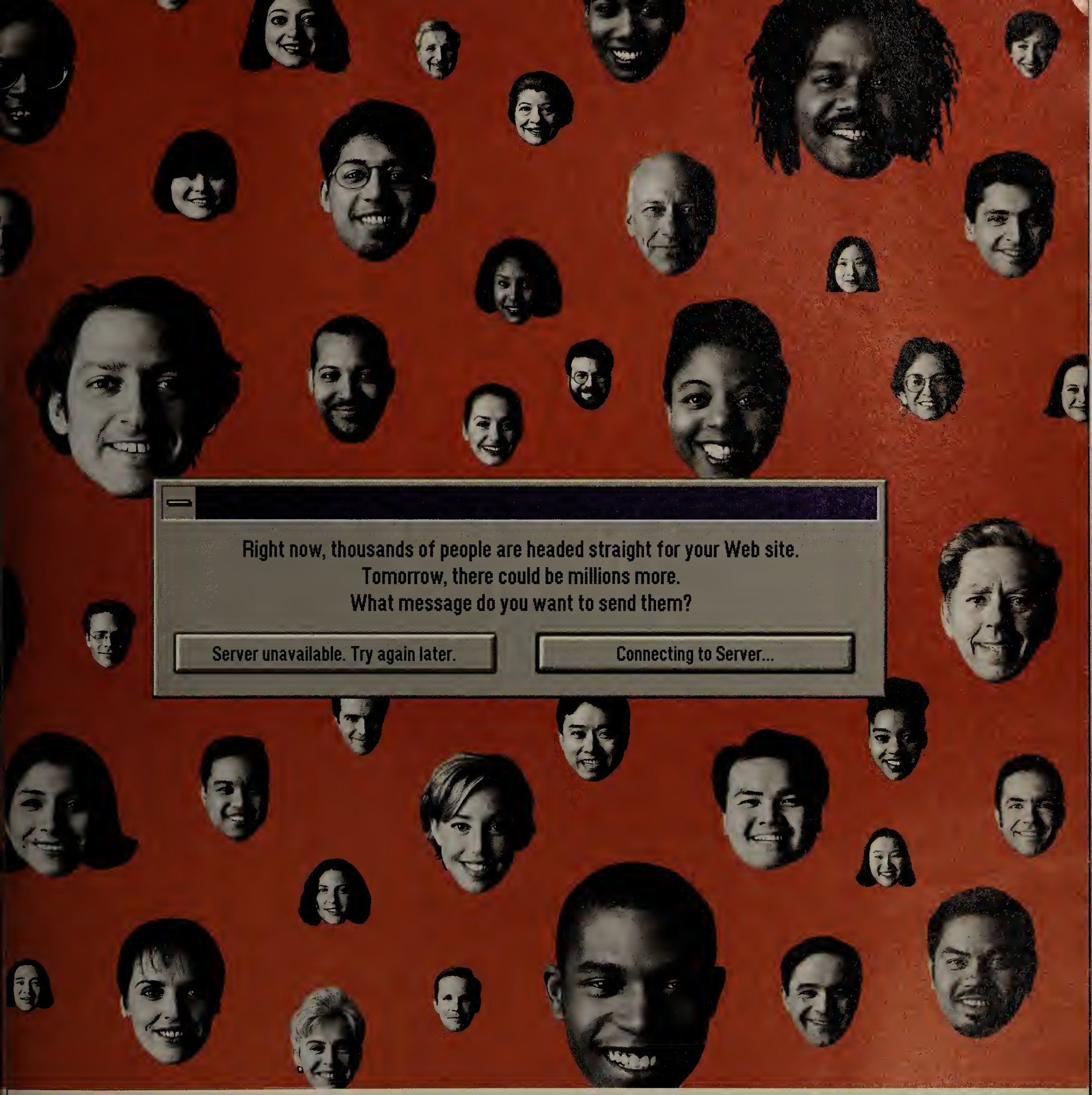
Both versions are available in 16- and 32-bit formats for the entire Windows family.

Frontier's CyberSearch 2.0 (www.xxx.com) off-line browser works with the America Online, Inc. GNNWorks, Microsoft Internet Explorer, Netscape Navigator and Spyglass, Inc. Mosaic online browsers. It includes a Lycos-based search engine, bookmark organizer and Lycos itself on CD-ROM.

Frontier's more encompassing intranet entry, the turnkey Intranet Genie, is scheduled to ship this month. The package includes a number of client and server products on CD-ROM.

Intranet Genie's centerpiece is the Windows NT-based SuperWeb Server with Verity's search engine. It also includes Web administration and authoring tools, an electronic mail server and a client browser. Other vendors' products can be swapped in for Frontier's components without incurring compatibility problems, says Ann Krauss, marketing communications manager for the company.

Wizards ease installation and templates accommodate existing applications. Users can customize their mail with a filter that sorts messages, even based on content as well as subject headings.



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A related tool is shipping from Hitachi Computer called ZooWorks that records and indexes each Web site and HTML document that a user visits. The software runs on Windows 95 and Windows NT.

In another noteworthy client-side move, Hummingbird Communications Ltd. (www.hummingbird.com) has posted its Columbus intranet desktop on the Internet for evaluation. The Windows app integrates intranet/Internet access with administrative apps and electronic doument technology. Retail price is $245.



Net managers can set Guardian's monitor to track sessions, flag specific activities as suspicious, and even suspend connections automatically under designated circumstances.

Authoring & development tools

Developers eager to plunge into the intranet will find a small but growing selection of tools that "Webify" existing applications. The concept is not unlike Microsoft's approach with ActiveX, which adapts existing OLE Custom Controls (OCXs) to Web sites.

Attachmate Corp.(www.attachmate.com) is extending its family of Emissary developer products with the Emissary Host Publishing System. With this product, developers can Web-deploy client-to-host applications and apply OLE and ActiveX controls. The system draws on the Web-to-host experience Attachmate has implemented in the Extra! developer products and works with the company's QuickApp software for integrating host screen data and QuickDB product for linking legacy databases.

"We find that customers want to move to the new intranet platform without creating new applications or retraining their developers or users," says Sandra Peart, Attachmate's senior product manager.

The Emissary Host Publishing System is intended to give users access to both relational and nonrelational host data through the common interface of the client browser. As many as 250 concurrent users can connect via LU 6.2 sessions. Because the conversion software is middleware running on a server, if a session locks up the server reassigns it and the user sees no interruption.

The tool suite costs $25,000 in a limited preview release due this month; it is scheduled for broad release later this summer.

In the first release, the Emissary Host Publishing System will support Visual Basic development environments and Microsoft's new ActiveX architecture. Updates will support Powerbuilder clients, and Borland International, Inc.'s Delphi and C++ development environments, Peart says. Version 1.0 supports 3270 connections; Attachmate will add links to AS/400, Digital Equipment Corp. VAX, and Unisys Corp. systems.

JSB Corp.'s INTRAnet Jazz Open Gateway similarly 'Net-enables Novell, Inc. NetWare LANs. It provides an IPX/SPX gateway that gives 32-bit Winsock applications access to the intranet and Internet.

The applications essentially share a TCP/IP stack at the server. The Jazz Server is a cross-platform intranet Web server, supplying caching, a search engine, proxy server and management functions, according to JSB (www.intranet.co.uk).

For the client, users can mix and match browsers, organizers and E-mail software, or use the applications bundled with the desktop.

Client software costs $295; server software varies with volume, but begins at $495 for a five-user license.

Purveyor IntraServer for Windows NT from Process Software, Inc. (www.process.com) provides a portfolio of Web-based products that helps migrate files and databases from a PC LAN to intranet data publishing and collaboration environments.

Purveyor IntraServer adds encryption and several applications to Process Software's Purveyor WebServer. For example, it includes translation software for word processing files and wizards for linking Web pages to existing databases for information retrieval.

Purveyor IntraServer for Windows NT costs $1,095 without the wizards module and $1,395 with it. A NetWare version is scheduled for release this summer.

Allen Systems Group, Inc. (www.Webgalaxy.net) is targeting high-end developers with its rapid application builder for Web sites and applications. The product, called WebGalaxy, is intended to help users "move beyond Web pages to application development environments using Web technology," says Dave Bunker, Allen Systems vice president of marketing and business planning.

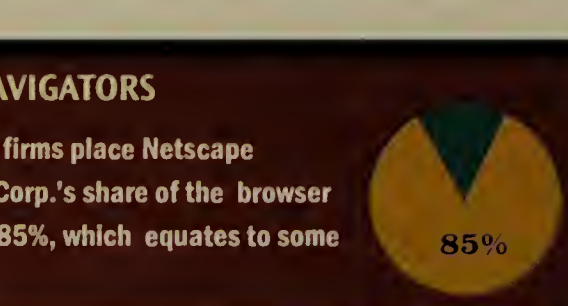
WebGalaxy provides an easy point-and-click application development process and generates Java code without requiring knowledge of the language. "It's for programmers doing Web business development, not just page design," Bunker says.

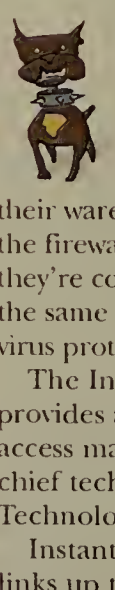
The developer version is free of charge for building and testing on a single workstation; Allen Systems licenses the software when it goes on a Web server. Pricing varies with platform, ranging from $5,000 for an Intel Corp.-based Windows NT server to $30,000 for a high-end Unix server.

Just the Facts

AWASH IN NAVIGATORS

Market research firms place Netscape Communication Corp.'s share of the browser market at about 85%, which equates to some 20 million users.





Security

Internet security product developers have been quick to adapt or extend their wares to intranet security. Certainly within the firewall (and intranets need a firewall, since they're commonly also the route to the Internet) the same security concerns exist, among them virus protection as well as guarding corporate data.

The Instant Internet hardware/software box provides a safe chute to the Internet and a user access management tool, says Jonathan Schmidt, chief technical officer of Performance Technology, Inc., (www.pertech.com).

Instant Internet 3.1, which ships this month, links up to 50 users on a NetWare LAN, offering a single access point to the Internet or the corporate intranet. The latest update supports ISDN, external routers and frame relay connections, useful for virtual private nets. For remote users, incoming access to an intranet or file transfer protocol server is available through secure controls authenticated by NetWare Directory Services.

It handles one common intranet problem: illegal IP addresses. Rather than reassigning or translating illegal IP addresses, Instant Internet can work with duplicate addresses so a user's machine doesn't freeze, Schmidt says.

The same manager-specified controls on Web access can be applied internally as well as for Internet cruisers. For net managers, Instant Internet supplies an administration screen that identifies users by icon and reflects their network connections and activities by different colors. Managers can restrict access by the time of day or type.

Instant Intranet is available for Ethernet or token ring; prices range from $3,495 for Ethernet to $5,095 for token ring.

NetGuard, Inc., of Dallas, is making a new firewall available online for a 30-day trial. Guardian is composed of a gateway agent, which acts as a firewall, and a management system, which controls all gateways. The pair, intended for use on corporate LANs, supports Windows NT and IBM OS/2 networks.

The gateway examines each IP data packet that passes between a private net and the Internet. It also can guard intranet access between workgroups. Network managers can specify suspicious activity to note and the appropriate response, and can manually control monitoring when desired. Net administrators can even limit data volumes to protect bandwidth.

An optional add-on, called Network Address Translation, lets private IP clients maintain an address scheme independent from the IP numbers used in Internet access.

Pricing begins at $3,980 for a single gateway agent maintaining up to 50 simultaneous sessions; additional gateway agents cost $2,980, and volume client licenses are offered.

NetGuard: (214) 738-6950; http://www.netguard.com

Performance Technologies: (210) 979-2000; http://www.perftech.com. ■

The worldwide market for Internet and intranet technologies topped $5.34 billion in 1995, says Zona Research, Inc.

Of 153 IT professionals Zona recently surveyed, more than half run their browsers on Windows 95.



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The new

It was 1994, and surfing the 'Net was not yet a national pastime. A Dow Chemical Co. research and development group needed to swap electronic mail and share documents with each other.

Some of the staff used the Internet and World-Wide Web for research, and that seemed a logical model for the resource sharing the research and development group sought for their workgroup. So they built an internal Web site from parts on hand and what they could find online.

"Our first intranet was ad hoc, just done by the people who had the means," said Jay Vander Wall, a manager in Dow's Global Information Systems Technology Center.

Today, that intranet is being brought into Dow's corporate fold and upgraded with commercial software, as Dow prepares to this month give some 26,000 users access to dozens of internal Web sites, many of them still under construction.

Dow's story is typical: An initial project spawns rethinking and reorganization of corporate information-handling strategies. It's happening in corporations around the globe.

In ways not seen since the advent of the microcomputer nearly two decades ago, users are embracing a technology that can fundamentally change the way information is handled and distributed.

Using inexpensive and plentiful tools wrested from the Internet, companies are erecting private Webs, or intranets, that answer many of the typical corporate challenges of data distribution, team collaboration, cross-system messaging and even commerce transactions.

But unlike the PC-prompted power struggles of the early '80s, today's information technology (IT) denizens are accepting the new tools and helping users implement them.

"It's too easy for anyone to put up a Web server. IT won't even know. So IT might as well get in there to help," said Alan Holzman, technology manager for Internet and online services at Intel Corp. in Hillsboro, Ore. Holzman is an intranet activist, advising colleagues and customers how to assess and accept the new technology.

Like many IT staffers, he realized this information technology revolution could occur without IT's help, but would be even more significant if they joined the effort.

"Traditional IT is very centralized and very dictatorial," Holzman said. "That won't work in this space. You won't get that horse back in the barn."

Tracing roots

The intranet explosion has short, easily traced roots. First was the Internet. After decades in academia and government use, the Internet was only recently tapped by a broader user community, partly due to the arrival of the World-Wide Web, which made it easy to navigate the Internet and added multimedia functions.

While many businesses have spent the last year hurriedly launching Web sites - even when they weren't entirely sure why - the ease of use, interoperability of the tools and the low cost of the technology have made it clear how internal Webs could pay off.

"It makes sense for almost everything we were publishing on paper," said Joseph Urda, advanced technology database administrator with Boeing Information Services, Inc. at Kennedy Space Center in Florida. The company's internal Web sites feature employee handbooks and forms from the human resources department, company newsletters, catalogs and infor-

The intranet cyclone is reenergizing corporations by blowing the top off of stringent information control practices and simplifying data access.

PHOTO ILLUSTRATION BY ROBERT ATKINSON

IT

BY PEGGY WATT

mation about upcoming events.

In fact, internal Web sites are a godsend for distributing typical corporate information that changes frequently, such as telephone lists. They also prove useful for online help desks, which users can consult for technical support before or instead of calling IT.

"It's a way to automate a lot of the support work," said Terry West, an IT manager at Rand Corp. in Santa Monica, Calif.

Some say the intranet movement is the PC revolution all over again - but it's happening even faster than microcomputers infiltrated businesses in the late '70s and early '80s. Little more than a decade ago, corporate MIS departments suddenly realized that a lot of computing power had crept into the corporation. Funny thing was, management often still charged MIS with supporting that new equipment.

IT isn't letting that sort of thing happen again. Although Dow's IT group admired and studied the R&D group's intranet, it is assuming management and control of that first internal Web site as the IT group prepares to install many more throughout the company.

"We're centrally organized as an information systems group," Vander Wall said. "IS owns the infrastructure and is now taking ownership of the corporate intranets as part of that responsibility."

The new IT may be willing to accept intranet technology in part because of the earlier PC experience. The IT of 15 years ago often scoffed at the "underpowered" PC and dismissed the systems as toys and fads.

Today's IT recognizes the opportunity of the new technology. The browser supplies the easy-to-use interface to corporate data that users have clamored for. Web sites are launched relatively easily, thanks in part to numerous templates and design tools.

And the selection of connections from Web server to existing databases is already quite reasonable and the technology effective.

Also, perhaps corporate IT groups learned from the mistakes of the PC revolution. If department managers want something they perceive will help them do their jobs, they'll find a way to get it - be it a 128K-Apple Computer, Inc. Macintosh in 1984, an 8088-based IBM PC in 1981 or a shareware Web server running on a departmental Pentium in 1996.

"It's the people who have the checkbook who are demanding the intranet," said Mark Tebbe, president of Lante Corp. in Chicago. Lante, a consulting group, now devotes about a quarter of its time to Internet and intranet installations - up from zero about a year ago.

About half the time, customers are looking for a way to distribute information efficiently around the enterprise, drawing on existing client/server or legacy systems, and an intranet is the answer, Tebbe

INTRANET RESOURCES

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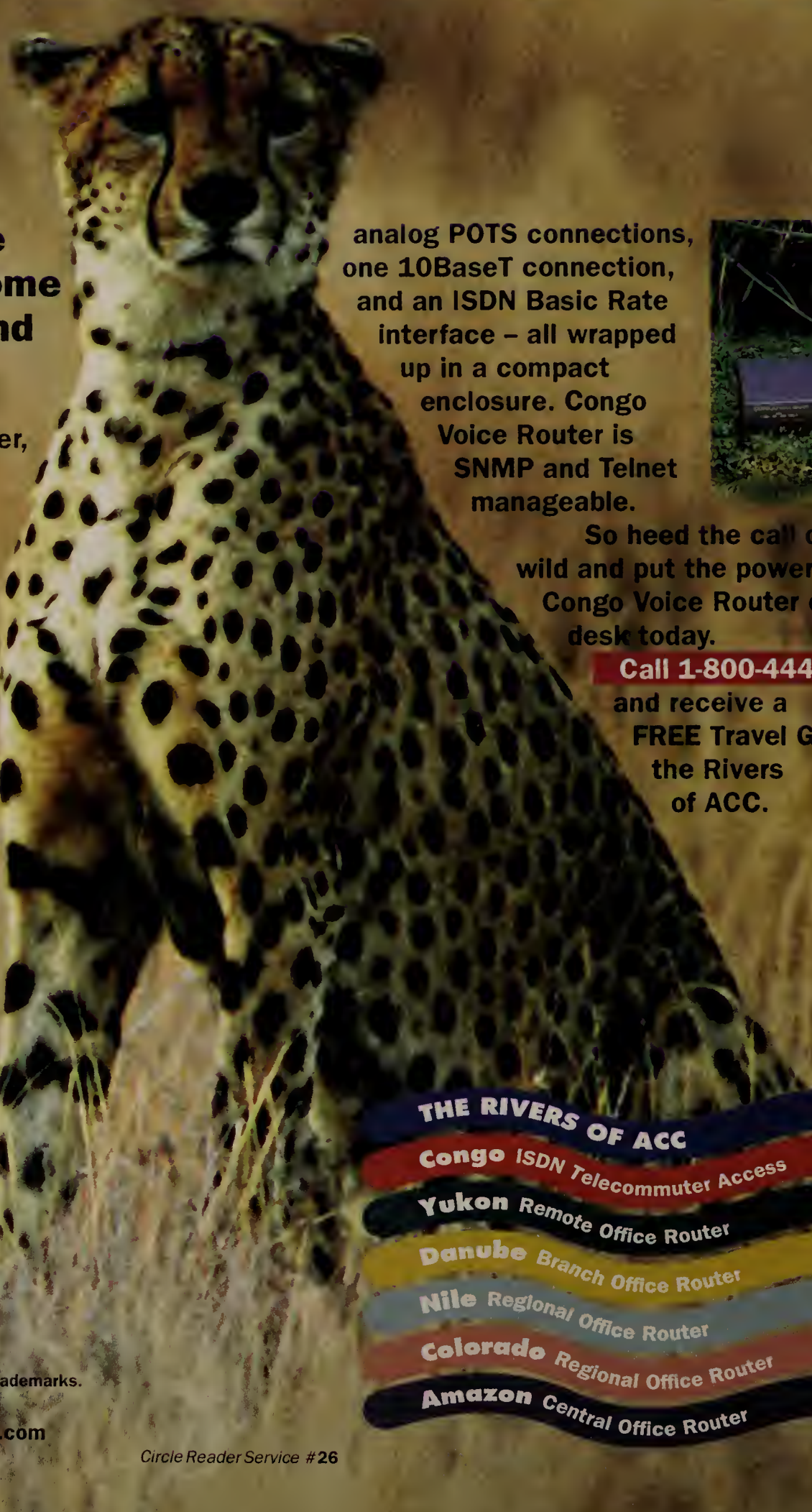
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Circle Reader Service #26

said. The other half of the time a workgroup knows it wants an intranet and often the rest of the firm follows suit.

But, Tebbe adds, those check-writing department heads enlist IT's help early in the process because they want access to corporate resources. An intranet might start as a skunk-works project, but IT gets involved quickly because of the plumbing requirements.

And when IT steps in, policies get drawn up. Often, companies write intranet and Internet policies at the same time because many of the issues are the same.

IT worries about security, privacy and protecting corporate data, both from outsiders

See Cover, *page 36*

THE DOW CHEMICAL CO.

The rollout of Windows 95 helped usher in the intranet age for The Dow Chemical Co. in Midland, Mich. The Explorer browser Microsoft Corp. bundled into the operating system made 26,000 Dow desktops Web-aware.

"Until then, if you knew how to use a TCP stack and a browser and could support yourself, you could use the Web. Now it's all in the default workstation," says Jay Vander Wall, a manager in Dow's global information systems technology center.



Dow's Vander Wall

Dow is now building 250 sites worldwide. It is using Microsoft's Internet Information Server running on Windows NT and several Netscape servers operating on versions of Unix as well as on Windows NT. The company also is building links from the Web servers to VMS and MVS databases.

Talking about server deployment issues, Vander Wall says, "A big challenge is, what is the load going to be? Are people going to whale away on it?" Some of the answers will come from trial and error.

The growing intranet population has led Dow teams to draw up intranet and Internet policies for design, content and terms of installation. "The policies are not drastic," Vander Wall says. "Intranets will only be implemented where they add value."

Per corporate policy, departments pay for their own sites, which the corporate IT group supports. Because IT owns the infrastructure, its staffers manage the servers and charge back the departments.

Getting started

A how-to guide to building your first intranet

BY MARK GIBBS

"It is no disgrace to start over.
It is usually an opportunity."
– George M. Adams

In many ways, bringing an intranet into your organization is like starting over.

Having spent the better part of a decade trying to wrest payback from decentralized, LAN-based information systems, IT groups are turning to intranets as a way to improve the cost-effectiveness of their distributed computing environments. Intranets are so compelling because they allow for simple, low-cost information publishing, as well as data collection and sharing, all with remarkable scalability.

But how do we get there from here?

First things first

Step One is to to get a solid understanding of how your intranet will be used. Typically, intranets are erected to support one or two publishing applications that, while not mission-critical, offer a real payback.

For example, staff directories, product data sheets, employee handbooks and other human resource materials fit into this category. Essentially, these are read-only data sets where user response isn't required. These applications can be easily achieved at low cost.

More ambitious applications use Web pages linked to back-end applications that retrieve or store data in databases. For example, many companies are building Web-based human resources applications that allow staff to check on vacation entitlements and other benefits.

Once you've identified a potential application, the good news is that many corporate networks are already well suited to support intranets. Unless unusual and remarkable levels of service are required, existing NetWare, Unix and Windows NT servers will provide adequate capacity.

Snagging a server

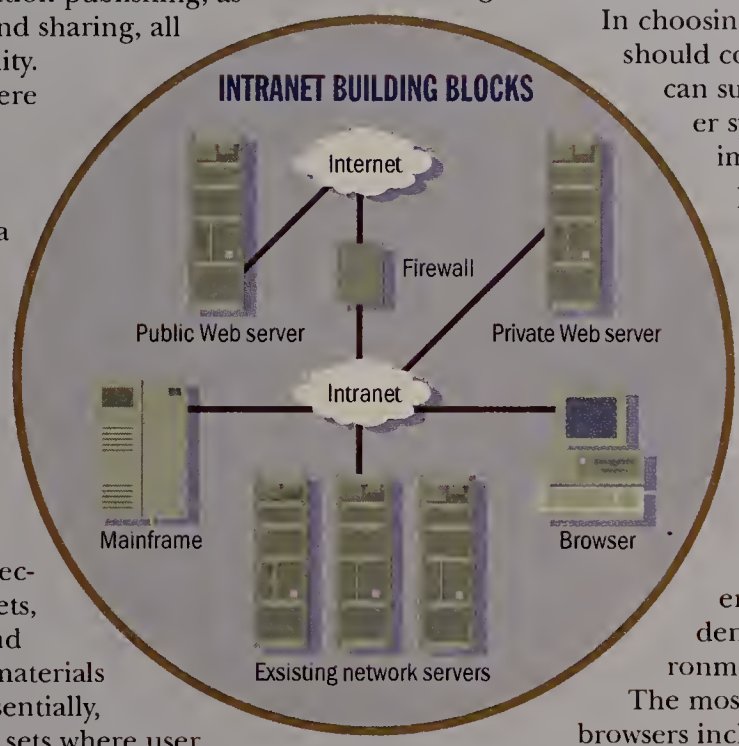
The core tools of the intranet are Web servers and browsers. Selecting a Web server simply requires knowing how much you want to spend for what facilities and what level of support.

At one extreme are freeware servers, which include the well-respected public collaboration effort known as Apache and free offerings from established vendors, such as IBM's Internet Connection Server and Microsoft Corp.'s Internet Information Server. These servers offer high performance, have good management and security facilities, and are very stable.

One drawback: There is no support for most of the freeware servers — although Microsoft and IBM do have a service plan, if you wish to pay.

At the other end of the cost spectrum are the commercial Web servers that can be used on mainframes, and servers with enhanced features for electronic commerce and specialized applications and database services.

If you're a NetWare site, Novell's NetWare Web Server is worth considering. It offers the highest performance of all Web servers and is well integrated with NetWare management.



In choosing a Web server you should consider whether you can support a particular server system (especially important when freeware products are considered), and whether the server is manageable and offers adequate security features and reporting facilities for your needs.

Bagging a Browser

The client or browser selection is dependent on the kinds of environments you want to create.

The most sophisticated browsers include Netscape's Navigator, Microsoft's Internet Explorer, Attachmate's Emissary and Sun Microsystems' HotJava. These products will allow you to support advanced presentation techniques and a whole range of add-on products.

Be warned: many products are effectively 1.0 releases and suffer major stability problems. What's worse, since browsers are free and easy to come by, a range of products (beta or fully cooked) may come to be used on your intranet.

As different browsers interpret Web data differently, it may be difficult to achieve a consistent look and feel to information delivered via your intranet. And in the absence of some corporate standards, you may wind up trying to support a dozen browsers and multiple release levels for each. That's the recipe for an MIS headache.

Which browser should you pick for a corporate standard? If you are looking for the most feature-rich solutions, Microsoft and Netscape are the obvious choices.

Unfortunately, if the browser market offers moving goalposts, these vendors provide jet-assisted ones. The best strategy is to choose a particular release level of the browser that offers the best feature and development direction for your future

See Started, *page 36*

Cover

Continued from page 35

and on a behind-the-firewall intranet; for example, personnel records should be protected. Many access issues are like those for any LAN, where users enjoy varying degrees of access privileges. Some companies even lay out matters of E-mail etiquette and appropriate Web content and presentation.

Several Dow teams tackled policy-setting, Vander Wall said. High-level managers determined what information belongs on the corporate Web site, what stays inside the firewall, and who gets access to what, even

See Cover, *page 46*

US WEST COMMUNICATIONS

At US WEST Communications, one team's desire to disseminate information led to the birth of a thriving intranet.

As part of a billing reengineering effort at US WEST in Denver, intranet evangelist Sherman Woo, director of information tools and technology, says he asked for $4 million and 40 people to work on an intranet project. He got $200,000 and four people.



US West's Woo

A couple of executives sponsored Woo's intranet plans, but he never received official corporate approval.

As such, Woo says he "borrowed machines and enlisted the disenfranchised" to build his intranet.

By the end of the first year, Woo had 6,000 users hooked up to one intranet Web server with a couple of thousand pages. At the end of Year Two, some 20,000 people were linked to 150 servers supporting about 22,000 pages.

"By keeping it informal and just practicing good business rules, we've allowed our group connectivity to grow naturally," Woo says.

An early intranet target was access to legacy systems, Woo says. US WEST has now tapped into a handful of the 40 to 60 core business systems.

One of those was the Facility Check Tool, which provides access to six legacy databases. It took Woo's meager staff just 45 days to create the link.

Although Woo had to champion his early efforts, corporate now embraces internal Web sites.

"I've been dubbed the master of ceremonies for serendipity," he says.

Started

Continued from page 35

needs. Stick with that release until a subsequent one is stable and provides a reason to upgrade.

Adding the gravy

Beyond these basic components, there are a host of specialized tools to help you build your intranet.

There are videoconferencing systems (check out the amazing low-cost VideoPhone from Connectix Corp. of San Mateo, Calif.), Web-based bulletin boards (look at the WebBoard product from O'Reilly & Associates, Inc., Sebastapol, Calif.), and conferencing systems (such as OpenMind from Attachmate Corp. in Bellevue, Wash.).

VideoPhone could be used for meetings, even over slow WAN links, while WebBoard could be used to maintain discussion areas for your workgroups or the entire corporation.

Finding products is easy — deciding what's best for your intranet could be trickier. The key is to roll out those products that address clearly identifiable needs, offer a quick payoff and are simple to implement.

Ownership and control

Once you have a solid network foundation for your intranet and have identified some publishing and service objectives, interesting questions will crop up.

For example, who's going to run the Web server? Who's going to fund its development and maintenance? And who will design and control content?

The questions concerning operation and maintenance are reasonably easy to resolve. It is important to set up a staff member to serve as Webmaster. While the Webmaster role is largely a technical one, it is rare to find someone who can perform all of the functions required. For larger intranets, a number of Webmasters may be required to handle operational, user and development issues.

Deciding what's best for your intranet can be tricky. Find products that address clearly identifiable needs, offer a quick payoff and are simple to implement.

Once you've addressed those issues, the question of who is allowed to provide content has to be resolved. For example, will any group other than IT be allowed to put Web servers up? And will staff members be able to put up personal home pages?

The first question is an interesting one because a Web server can be built even on low-end PCs — for example, 33-MHz 80386-based systems — running freeware Web servers. In organizations where there aren't any rigid controls over content, the number of Web servers has exploded.

In general, it seems that allowing all staff to publish on the intranet, with the requirement that they adhere to an acceptable use policy, works well and is the easiest to manage. And be prepared for an explosion of amazingly rich and useful content — staff members seem to grasp the concept very quickly and enjoy going from being an information consumer to an information provider.

So why do it?

One benefit of intranets is they tend to recentralize control over information technology. That benefit is most keenly felt when application lifecycle issues are considered. Although getting client/server applications onto desktops across an organization is expensive initially, the price pales next to the cost of supporting the users and rolling out patches and upgrades time and again. Intranets can simplify that maintenance and cut down on training and upgrades.

The big payoffs of an intranet lie in new methods of information distribution and collection, new opportunities to involve staff in the process, and the cost benefits of recentralizing some of those functions that are difficult to manage in a distributed environment. Organizations that build intranets will find that information publishing becomes a way of corporate life, and improved internal communications and a more effective community culture is the result.

The bottom line is that getting an intranet up and running is similar to most other IT projects: It requires strategy, planning and organization. But in all other aspects, it is easier, cheaper, more flexible and more scalable.

Building an intranet may well turn out to be one of your IT group's greatest successes. Starting over has never looked so good.

Gibbs is a writer and consultant based in Ventura, Calif. You can reach him at (805) 644-4999 or mgibbs@gibbs.com.

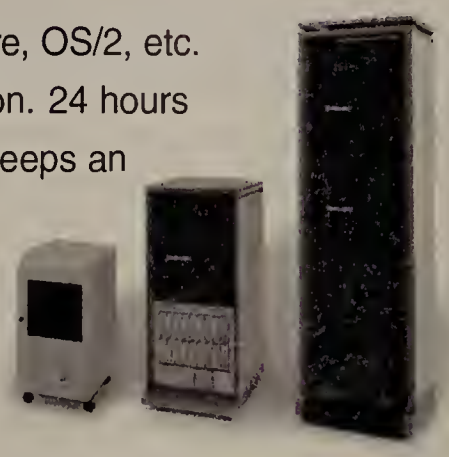
10 GUIDELINES FOR INTRANET DEVELOPMENT

- **Establish the management dimensions of your intranet early: who owns, who funds, who manages.**
- **If it is consistent with your corporate culture, encourage staff to become information publishers. They will do more to make the intranet happen than any amount of IT group-based content development.**
- **Decide to what degree and how you will set corporate standards for browsers, E-mail packages and so on.**
- **Build security into your intranet as a core strategic issue.**
- **Only roll out products and services that will have a quantifiable payback.**
- **Don't be afraid to be behind the leading edge; it is a new marketplace, and stability is what matters.**
- **Get top down corporate support for your intranet initiative.**
- **Keep your eye on the intranet marketplace — new products that could improve your intranet are appearing at an incredible rate.**
- **Integrate intranet services with existing network services where possible.**
- **Where services can't be integrated, plan to migrate to intranet services as soon as possible.**



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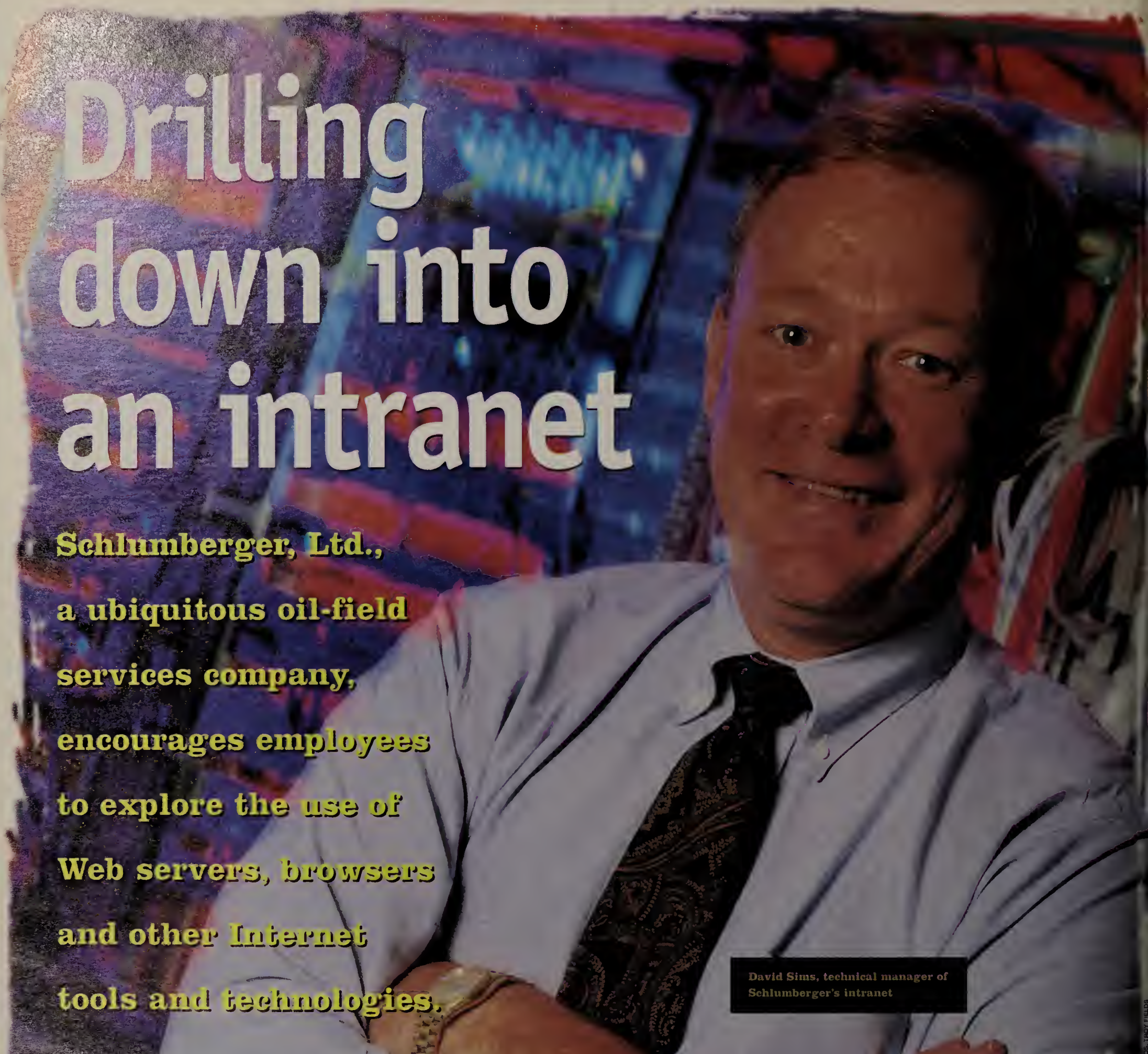
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Drilling down into an intranet

Schlumberger, Ltd., a ubiquitous oil-field services company, encourages employees to explore the use of Web servers, browsers and other Internet tools and technologies.



David Sims, technical manager of Schlumberger's intranet

PHOTOS: TROY FIELDS

BY BETH SCHULTZ

Engineers for Schlumberger, Ltd.'s Dowell unit are feverishly pumping cement down a hole drilled deep into the ground of an African oil field. The cement is supposed to flow down a pipe set in the well and back up the space between that steel casing and the earth, and then harden.

Following instructions found among the pages of a 13-volume manual published 18 months earlier, the engineers have modified the cement with an assortment of specially designed chemicals to stop gas from migrating into it during the curing process. But the workers have not received the latest paper-based manual updates recently distributed by Dowell operations, so they do not realize that company researchers have found a way to improve the performance of cement pumped under the conditions found in the African oil field.

As a result, the cement being pumped is not going to harden as well as it might, and the well operator — Schlumberger's customer — will have a hard time pumping the oil.

Give it another six months, and a scenario like the above will be almost impossible. That is because Dowell is halfway through a transition from distributing updates on paper to doing so electronically. By the end of the year, engineers will be able to access up-to-the-minute information stored on a corporate Web server.

Dowell, one of the seven oil-field services companies owned by New York-based Schlumberger, has already put its manuals on CD-ROMs that engineers can simply pop in their computers and quickly search. The next step is to put the documentation on Schlumberger's intranet and to format the CD-ROM-based data using HTML. Then it can embed hyperlinks that will take engineers from the CD-ROM-based documentation to live



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server updates, explains Meghan Stevens, manager of information technology (IT) for Dowell in Sugar Land, Texas.

"Sometimes we change the manuals because of something that could go wrong, so it's important that the engineers get timely information in the field," Stevens says. By placing the documentation on an intranet, Dowell can update it on a minute-by-minute basis and keep its field engineers informed and oil-field processes flowing.

Growing up on an intranet

Documentation is just one of scores of applications Dowell and other Schlumberger business units are running on the intranet. In fact, while intranets are in their infancy at most companies, it is hard to remember life without one at Schlumberger, say several managers who work at the corporate giant's Sugar Land campus.

"The intranet has become such an embedded part of our culture that it's hard for me to think of anything we do that doesn't use it," says Thomas Bates, president of Anadrill, the Schlumberger company that drills the oil wells.

Likewise at Wireline & Testing, says R. Bruce McCann, vice president and general manager of the business unit's Houston Product Center. "We use the intranet as a tool for providing, maintaining and utilizing information. You forget about all the paper that used to go out," he says.

Schlumberger can trace its intranet roots back to 1991, when it adopted the Internet as the model for its internal network. It made that choice after examining ways to update the capabilities of a 5-year-old X.25 packet-switched network. Schlumberger was looking for a solution that would let it run a multivendor, cross-platform environment.

"We did not want to decree that everyone had to use Brand X. One of the cultural features of Schlumberger is that we try to encourage — not stifle — creativity. We don't want to 'edict' that someone can't have something from a corporate point of view," says David Sims, technical manager of the intranet, which is called the Schlumberger Information Network (SINet).

Such a stance precluded Schlumberger from doing business with telephone companies and traditional computer vendors such as Digital Equipment Corp. and IBM because they didn't have the degree of openness Schlumberger sought, Sims says.

"We came inescapably to the conclusion that the only way to get where we wanted to go was to use the Internet, a system the universities and the military had demonstrated and modeled for addressing exactly the same problems that we were trying to," Sims explains.

Knowing about the Internet

Schlumberger is a highly technical company — about one-half of its 50,000 employees are engineers with graduate degrees — with a significant devotion to research and close ties to universities, Sims says. To support research activities in the early '90s, Schlumberger had an Internet connection in Austin, Texas, and one in the San Francisco Bay area.

"I wouldn't say there was a general awareness of what was going on, but in 1991, there was some visibility of the Internet within Schlumberger," Sims says.

So Schlumberger embarked on its Internet course, which at the time was considered a relatively risky technical plan for a corporate user since no major vendors supported the environment. It began the transition by consolidating the two 64K bit/sec Internet connections to a single T-1 gateway from the network operations center, which was in Sedalia, Colo., but has since been moved to Houston. It then began building a backbone that used Internet technologies and protocols.

Initial efforts focused on connecting research centers in places such as Austin; Cambridge, England; Ridgefield, Conn.; Paris; and Toyko so engineers could collaborate electronically, Sims says. At the time, the three big applications were electronic mail, File Transfer Protocol and interactive

THE SCHLUMBERGER INFORMATION NETWORK

Schlumberger, Ltd. has relied on Internet tools and technologies for its internal network since 1991. Today, the company:

- **Provides E-mail and Internet and intranet connectivity to about 23,000 employees worldwide.**
- **Has put up about 70 official Web servers, most of which are freeware, and about 20 Gopher servers.**
- **Holds a corporate license for Netscape's Navigator browser.**
- **Uses public domain software for its Web-based corporate directory services.**
- **Runs a Lycos search engine on the intranet.**
- **Encourages business lines to use the intranet for information-sharing, document-distribution, collaboration and other applications.**

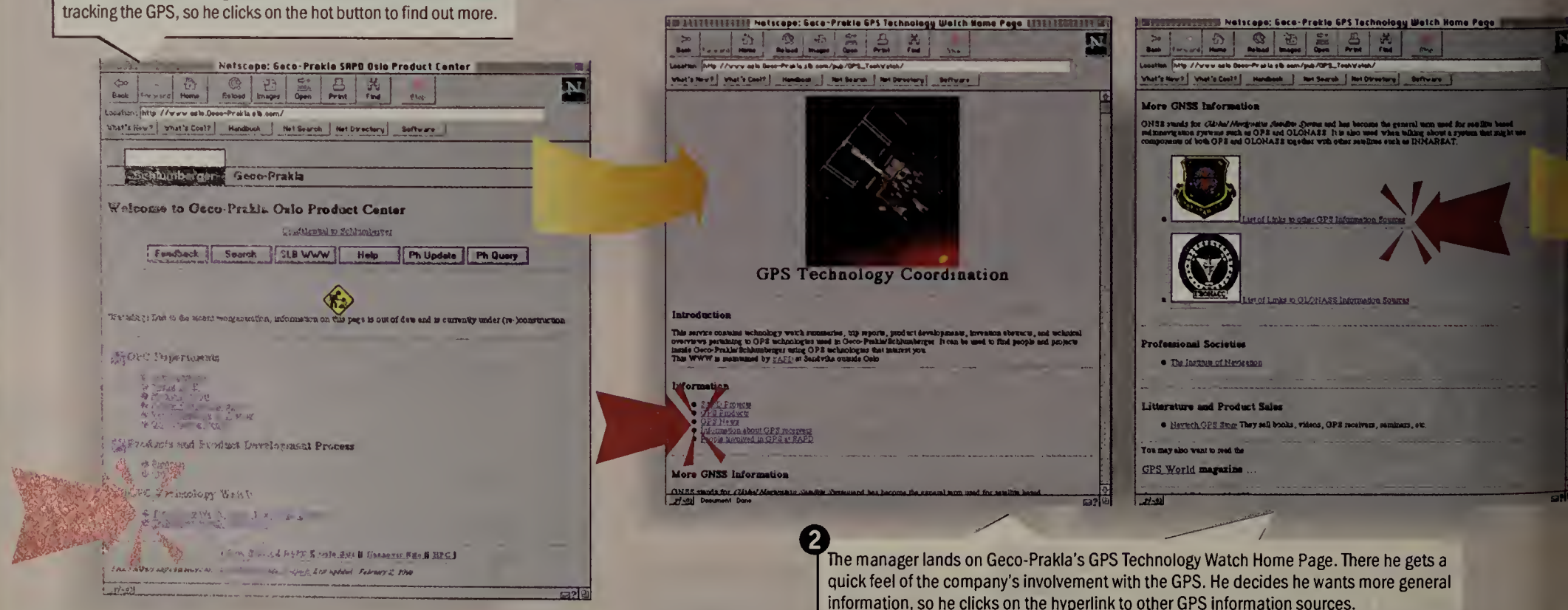
SITE SEEING

Precision drilling

Managers for Sedco Forex, a drilling contractor owned by Schlumberger, Ltd., are in discussions with an oil company that wants to set up a marine drilling rig in the deep waters off the West African coast. One of the oil company executives wants to know if Sedco Forex can take advantage of the GPS in its work.

GPS? The Sedco Forex officials are aware of the military's Global Positioning System and know that other Schlumberger companies use it, but haven't done so themselves. They suggest a break so they can quickly get up to speed on the technology.

1 The first thing a Sedco Forex manager does is fire up his laptop and tap into Schlumberger's intranet. Using a Lycos search engine on the intranet, he seeks out information on internal use of the GPS. His search takes him to the product center in Oslo, Sweden, run by Schlumberger's seismic acquisition company, Geco-Prakla. The manager discovers that Geco-Prakla has been tracking the GPS, so he clicks on the hot button to find out more.



2 The manager lands on Geco-Prakla's GPS Technology Watch Home Page. There he gets a quick feel of the company's involvement with the GPS. He decides he wants more general information, so he clicks on the hyperlink to other GPS information sources.

FROM OIL FIELD ENGINEER TO INTERNET EVANGELIST



At Schlumberger Ltd., where people frequently move from one business unit to the next, the running joke is: Yesterday he didn't know how to spell it and today he's in charge of it.

For David Sims, the "it" networking technology. In 1990, Sims was carrying out his duties as vice president and general manager of the North and South American operations of Geco, one of Schlumberger's oil-field services businesses. At that time, the folks running the company's private X.25 packet-switched backbone asked if he'd like to be involved in evaluating next-generation network technology.

Sims said yes and has been part of the information technology department ever since. He spearheaded Schlumberger's drive to standardize on Internet tools and today serves as technical manager for the resulting intranet, called the Schlumberger Information Network.

A mechanical engineer by degree, Sims has worked at Schlumberger for 25 years. He's spent all but the last six in a variety of engineering and management positions for the company's well testing and seismic acquisition divisions.

Even though he's a relative newcomer to IT, Sims says he's always been an early adopter of technology. "I had one of the first IBM PCs in my office," he says.

"Over the years, I've become so excited over the possibilities of technology," Sims says. "Some people around here would say I've become a fanatic, but I love to think about how you can do things faster, easier and with better results through technology."

— Beth Schultz

login to remote hosts.

Schlumberger's goal was to bring critical mass across disciplines to each center. "By improving communications, we could achieve a virtual critical mass at all the centers. That means lower costs," Sims says.

The Schlumberger network team quickly realized that the Gopher servers that populated the Internet could be used internally to enhance productivity. So they implemented between 20 and 25 Gopher servers and started hosting data on them. Sims recalls that some of the earliest information people created for the servers consisted of technology tips and best-of-breed shareware downloaded from the Internet.

"The Gopher servers were extremely easy to put up in that they didn't need HTML and could run on a Mac or PC and just serve files. They got people interested in using that technology," Sims says. "We think of the Gopher as the prototype of the Web initiative."

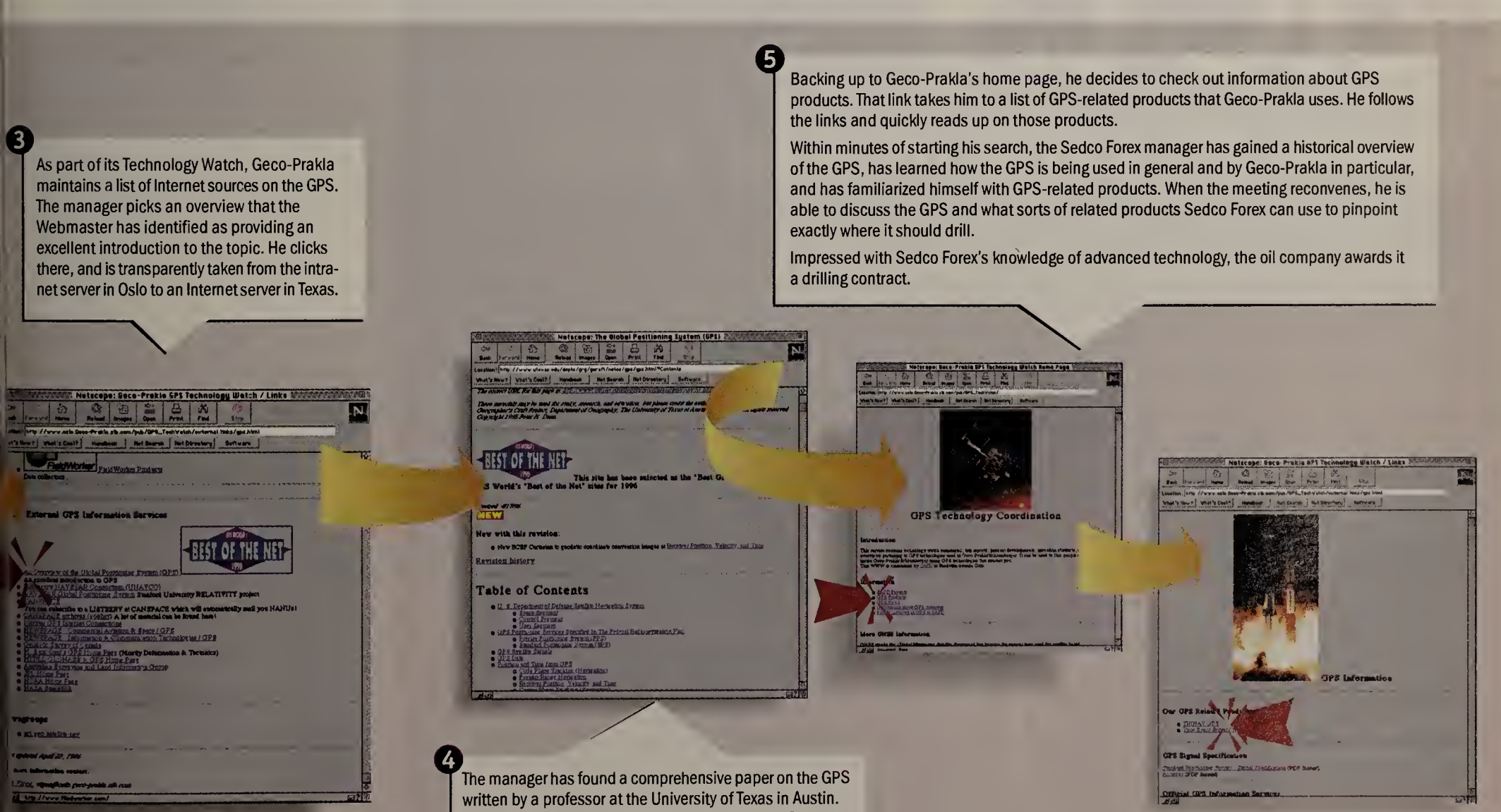
The move to Web servers started a year or so later. One of the researchers caught wind of work Tim Berners-Lee was doing at the Center for High Energy Physics to create a worldwide web of hyperlinked, context-sensitive servers. He went to visit Berners-Lee to find out more about his plans and to figure out how those plans might affect Schlumberger.

Although Schlumberger immediately recognized the significance of Berners-Lee's concept of serving up hyperlinked, context-rich information, it did not widely sanction use of any such servers until mid- to late 1994, when Netscape Communications Corp. introduced its Navigator 1.0 browser. "We wanted the browsers to be robust enough so we wouldn't have to provide user support," Sims explains.

It's no wonder why. Of the 28,000 Schlumberger professional employees, close to 23,000 have E-mail addresses and desktop connections to the Internet and intranet, says Larry Gutman, vice president of information technology for Schlumberger. And since Schlumberger holds a corporate license for the Navigator browser, each of those networked employees can have a browser.

"The single largest impact of the adoption of the World-Wide Web and Netscape has been ease of use by the casual user," Sims says. "Information can now be accessed without knowing the intricacies of network applications and the variety of services that are available."

Throughout Schlumberger, employees are encouraged to use Internet tools and technologies and to create intranet sites. "If someone finds a way to do the job easier through the Web, we're certain-



ly not going to stop him," Sims says. "Of course," he adds, "results have got to be apparent in the economics — you want to minimize network charges and reduce budgets."

Working the intranet

Folks at Schlumberger companies independently create Web pages, which are typically open for anyone within the company to peruse. The SINet home page, which is managed by a Schlumberger researcher in his spare time, provides a variety of information, from tutorials on Web technologies to instructions on how to use the page as a default starting point for a site rather than creating a separate home page.

The researcher also maintains a list of the 70 or so official Web servers set up by the different business units. "People know that if they want to get a link to their server, they have to send the information to him and he'll do it. It's very informal," Sims says.

While Schlumberger empowers employees, it does not let them run wild, Sims notes. The company has guidelines — accessible on the intranet, of course — for creating and posting content. Web sites get supervisory approval before they can be linked to the intranet.

"I don't spend a great deal of time scrutinizing everyone's Web page," says Sims, noting that he and three other IT professionals are ultimately responsible for the intranet. However, Schlumberger runs a highly decentralized organization so each business unit provides the first level of site oversight.

"We ask people to use good judgment — there's even a line in the corporate guidelines about common sense," Sims says. "I wouldn't say that our process is fully developed, but it works."

As part of that process, Schlumberger strictly limits outsider connectivity to the intranet, which is surrounded by firewalls and further protected through authentication techniques using IDs and passwords. Sims says he is also examining encryption techniques and will probably deploy that technology, as well.

The company has allowed partners to access files on intranet servers, but that is done only through special arrangement.

However, Schlumberger employees can dial into the intranet from remote locations and move freely from the intranet to the Internet. One popular internal site, for instance, is called Technology Watch. As the name suggests, it provides status reports on new and emerging technologies. Users can click on a hyperlink and be whisked off to the Internet proper to read information on pertinent external Web pages, Sims says.

"The user inside Schlumberger sees the Web server and that Web server inside Schlumberger might have links to Web servers outside Schlumberger and the user inside the company often doesn't know the difference," Sims explains.

E-mail and then some

At its most basic, SINet provides the ability to easily and inexpensively locate and exchange E-mail messages with colleagues. To find each other's electronic whereabouts, employees can use the browsers to tap into a user-maintained database, which Schlumberger built using public domain software called Ph/Qi.

"Our corporate directory, which has got everybody in the company in it, cost us zero dollars," Sims proudly stresses.

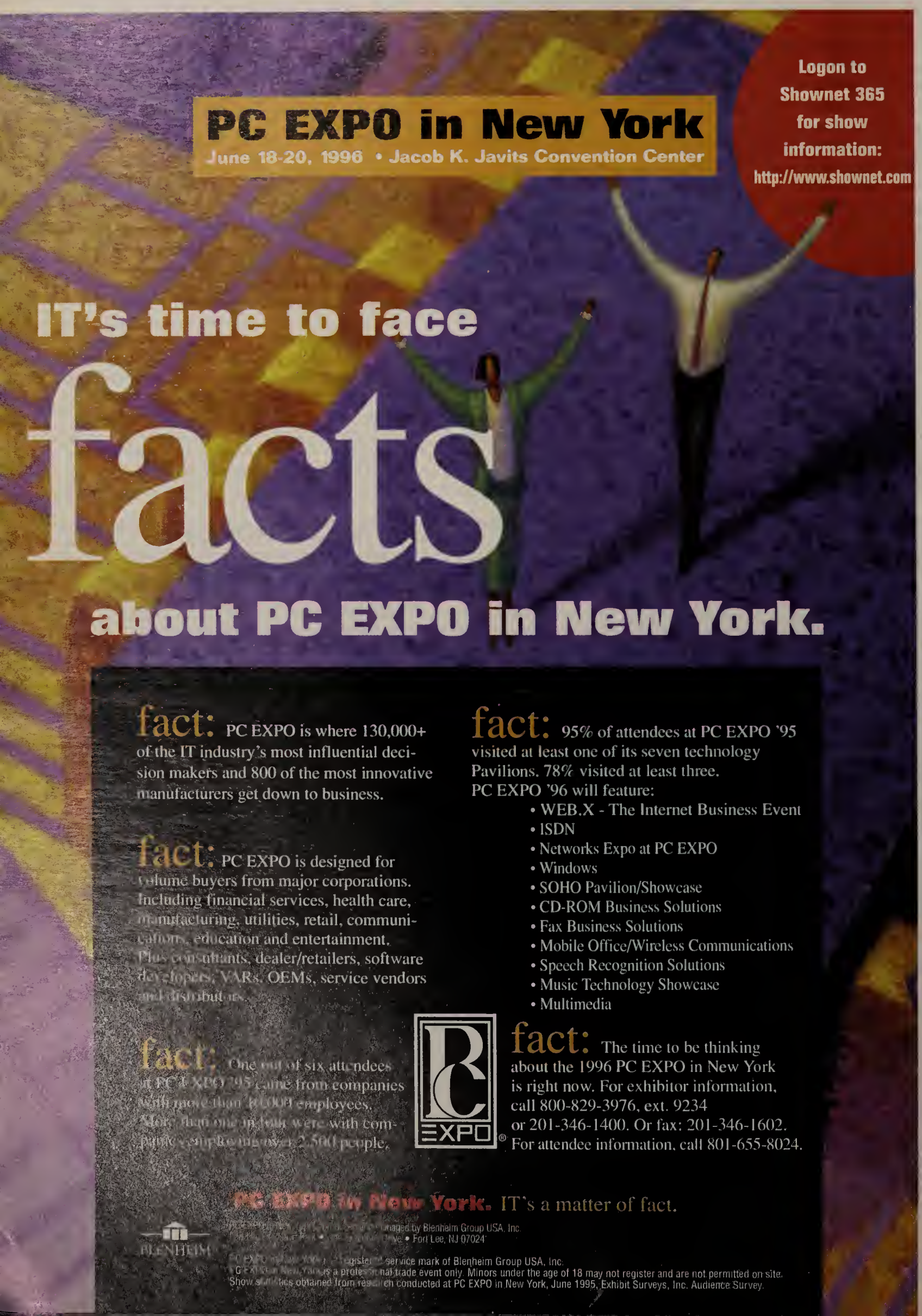
Users in the company are responsible for their own entries. "If somebody can't send somebody mail because the Ph records are off, it's the recipient's problem," Sims says. "Most people understand that if they don't maintain their records, then they won't get E-mail."

Schlumberger also uses the same Ph/Qi directory as a locator service. For instance, employees can use the directory to find local restaurants and hotels in any of the cities in which the company operates.

Beyond the corporate directory service and E-mail, Schlumberger makes extensive use of Web and a few Gopher servers for information sharing, software distribution and collaboration, Sims says. It uses a Lycos, Inc. search engine internally, too.

Dowell engineers, for example, use the intranet to download the software they need to design pumping services for specific oil industry clients. By stor-

See Schlumberger, *page 4*



The Wizard of Oz interface, Web browsers give mere mortals control over a growing number of resources.

It's not just a browser anymore

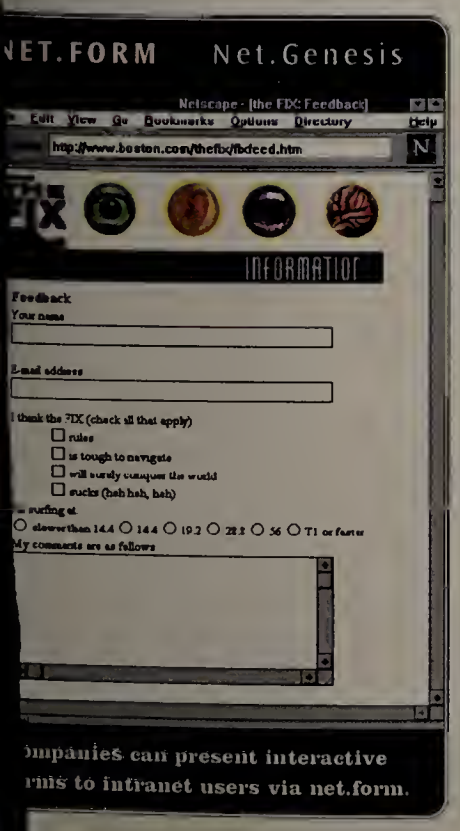


ILLUSTRATION: FRANK FRISARI

BY PAULA JACOBS

Imagine a single piece of client software that you can use for all sorts of intranet applications, from database queries and forms creation to document control and network management.

Chances are, this very software already sits on your PC and you use it most every day. At first, you probably marveled at how easy it was to use — point, click, and presto, get what you're after. After awhile, it seemed like old hat.



Well, here's a news flash: Creative enterprise managers have found that with a bit of imagination, and perhaps a little tweaking or some commercial add-on software, Web browsers can enhance the corporate intranet and simplify their lives. A browser can easily serve as an all-purpose interface to a multitude of applications running on a mix of platforms, from PCs to Macintoshes to Unix machines.

Aside from their original purpose as easy-to-use tools for cruising the Internet, browsers are the natural link to the homegrown and commercially developed applications cropping up on internal World-Wide Web servers. And as vendors continue to enhance their applications software with browser-based interfaces, the explosive adaptation of this Web tool is expected to continue unabated.

In 1995, Web browsers numbered 5.3 million worldwide, according to International Data Corp.'s Commerce Program. That figure is expected to balloon this year to 13.8 million, and a little more than half of these browsers are earmarked for intranet use, says the Framingham, Mass., research firm.

Just how pervasive is browser technology? It is now part of every desktop application, says Tom Pincince, senior analyst with Forrester Research, Inc.'s Network Strategy Service group in Cambridge, Mass. "The browser is becoming the major component for users viewing corporate data," he explains.

Take long-time intranet user Digital Equipment Corp. Its Web browser interfaces to an internal problem-tracking and -resolution (PTR) system that lets beta testers report software problems using forms created in standard HTML. Although the system runs on a VAX/VMS system, users can access it from any type of desktop computer via a browser client. PTR components running on the VAX consist of a Web server and a relational database system.

Digital expects that PTR will provide a standard mechanism for tracking software problems while improving response time, says Marianne Anderson, a principal software engineer at the Maynard, Mass., company. Once the system is functional, customers will access it via Digital's home page.

Any organization that provides customer service and support can adopt a solution such as PTR. For example, internal help desks can use this type of system to track user requests for assistance, or marketing departments can use it to obtain input on company offerings.

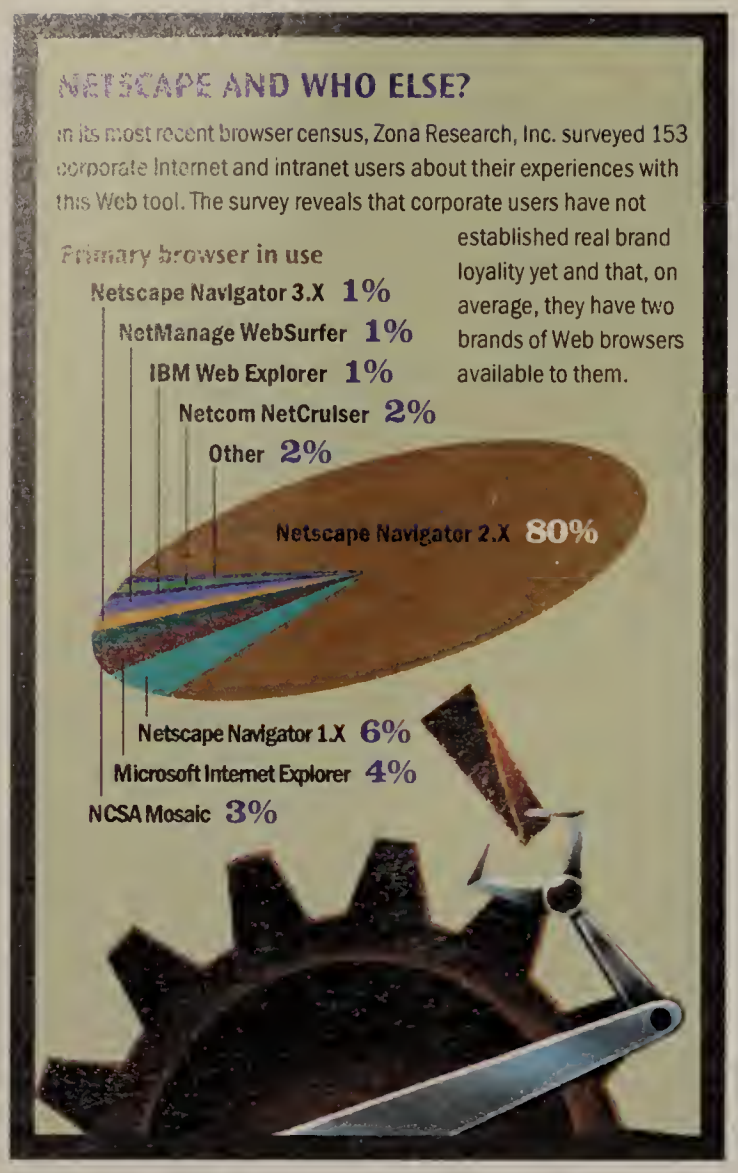
Browsers get smart

At Harvard University, Web browsers function as query tools for in-house human resource and financial services applications that reside on Unix servers. The browser decision was made in tandem with the university's decision to migrate a large human resource data warehouse from an IBM mainframe to a client/server environment.

A browser can easily serve as an all-purpose interface to a multitude of applications running on a mix of platforms, from PCs to Macintoshes to Unix machines.

"What's attractive about the browser is that it is free for the university environment; we don't need to distribute software; and it's on the desktop," explains Chayim Herzig-Marks, director of information resources for Finance and Administration at Harvard. "The browser is the only tool that users need, and we can upgrade or change the application software without upgrading the browser."

Harvard uses Netscape Communications Corp.'s Navigator as the client interface. Herzig-Marks says



he finds the browser significantly easier to use than mainframe query tools, which have cumbersome character-based interfaces.

Once an employee launches Navigator and connects to the Web server, a form pops up that asks what function to perform. The authorized user simply clicks on the right button and the application proceeds.

Harvard expects that more than 500 employees will use the human resource application, says Marilyn Shesko, data administrator at the university. "The huge advantage of browsers is that it is not necessary to have different versions of software running on a mixed platform," she says.

Network management is another possible use for a Web browser. For example, companies that use remote access servers and routers from Tribe Computer Networks of Alameda, Calif., can manage those internetwork products using the browser that is part of the vendor's WebManage software.

Tribe is just one of many companies embracing Web technology these days and integrating it into commercial software so customers can get more mileage out of their intranet browsers.

What if you want to use a Web browser to deliver real-time multimedia applications on the intranet?

Starlight Networks, Inc. of Mountain View, Calif., offers the ability to launch such multifaceted applications through its StarView module for either Netscape's Navigator 1.0 or 2.0. StarView streams video from a Starlight server and plays video embedded in an HTML page. The product works in conjunction with the company's StarWorks video networking software for Intel Corp. platforms and StarWare middleware for adding multimedia content to an intranet.

Or consider this: With browser in hand, users can fill out forms for all types of intranet applications, ranging from electronic purchasing to travel and expense reports.

JetForm Corp. in Ottawa has combined its JetForm Filler software with the Navigator 2.0 browser, enabling users to access and fill out forms right from the internal Web server. And Net.Genesis Corp. in Cambridge, Mass., permits browser access to its net.thread and net.form Web server software for conducting interactive discussions or creating interactive forms, respectively.

Cool collaborative computing

Enterprise managers who need to support collaborative computing over the intranet can check out

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NetworkWorld Fusion
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Groupscape 1.0, recently announced by Brainstorm Technologies, Inc., also of Cambridge. This software lets users build and extend Notes applications using a Netscape browser. With Groupscape, users can employ their familiar Netscape browser to access Notes applications, such as discussion databases, sales force automation programs, and human resources and project tracking systems. Thus, they can achieve functionality similar to that offered by Lotus Development Corp.'s own InterNotes product.

"Paper" trail

Document management is also becoming an increasingly popular application for Web browsers. Recognizing this, several vendors have introduced versions of their products that rely on browsers as the interface. InterLeaf, Inc. in Waltham, Mass., and Documentum in Pleasanton, Calif., are among the companies stepping up to the browser challenge in



this arena.

InterLeaf's solution, called Intellecte/BusinessWeb, lets users access business information from multiple document depositories via their browser of choice. Similarly, Documentum's Accelera software uses browsers to navigate and query a document repository.

Since implementing Intellecte/BusinessWeb last October, disk drive manufacturer Storage Technology Corp. estimates that it has cut the review cycle for product specifications from six to eight weeks to two days. In addition, the response rate from those on the review cycle has increased fourfold, to nearly 100%.

"This solution makes it easier for people to find documentation, saves time and costs less," explains Andy Hewitt, engineering manager for the company's Tools Department in Louisville, Colo. "It opens up a whole new world, and gives access to up-to-date documentation."

Document management also has gotten easier at Tandem Computers, Inc. since the company standardized on a browser-based document management system. Tandem of Cupertino, Calif., uses Netscape browsers and the Enterprise Document Management System from Documentum. This approach enables the computer systems manufacturer to manage internal documentation and specifications across multiple desktop viewing platforms. Software engineers use their desktop browsers to query a document repository via a Web server.

"The greatest benefit is rapid access to information to help software developers perform their jobs.



Intellecte/BusinessWeb gives users quick access to multiple knowledge repositories.



JetForm Filler lets users fill out paperwork, such as purchase orders, on the intranet

Anyone using a Mac, PC or Unix can read these documents, using an Adobe [Systems, Inc.] reader with Portable Document Format," says Kathy Osborne, document facility manager at Tandem.

"If we did not have the Web browser interface, people would need to install the Documentum client on all platforms," Osborne emphasizes. "It's a lot easier to depend on Netscape, which is on everyone's desktop; I don't need to track or worry about people having the software."

Even a number of highly specialized software products rely on the capabilities of off-the-shelf browsers. For example, DataFountain software from Dimension Insight, Inc. of Burlington, Mass., uses a browser to interface to Executive Information System (EIS) applications on the Web server and to access data from legacy systems and relational databases. Field sales representatives point and click to EIS-based sales reports via their Web browsers.

StrataCom, Inc. runs the DataFountain software in conjunction with its Web server, says John Douglas, IT director at the San Jose, Calif.-based network switch vendor. It uses the software so that employees working on PCs, workstations and Macs can access Network File System-mounted files.

"Users can access the EIS system regardless of what platform they are on because they just need a browser," stresses Douglas, explaining that users previously needed client software on their machines. "What's nice about DataFountain is that it uses a standard Web configuration."

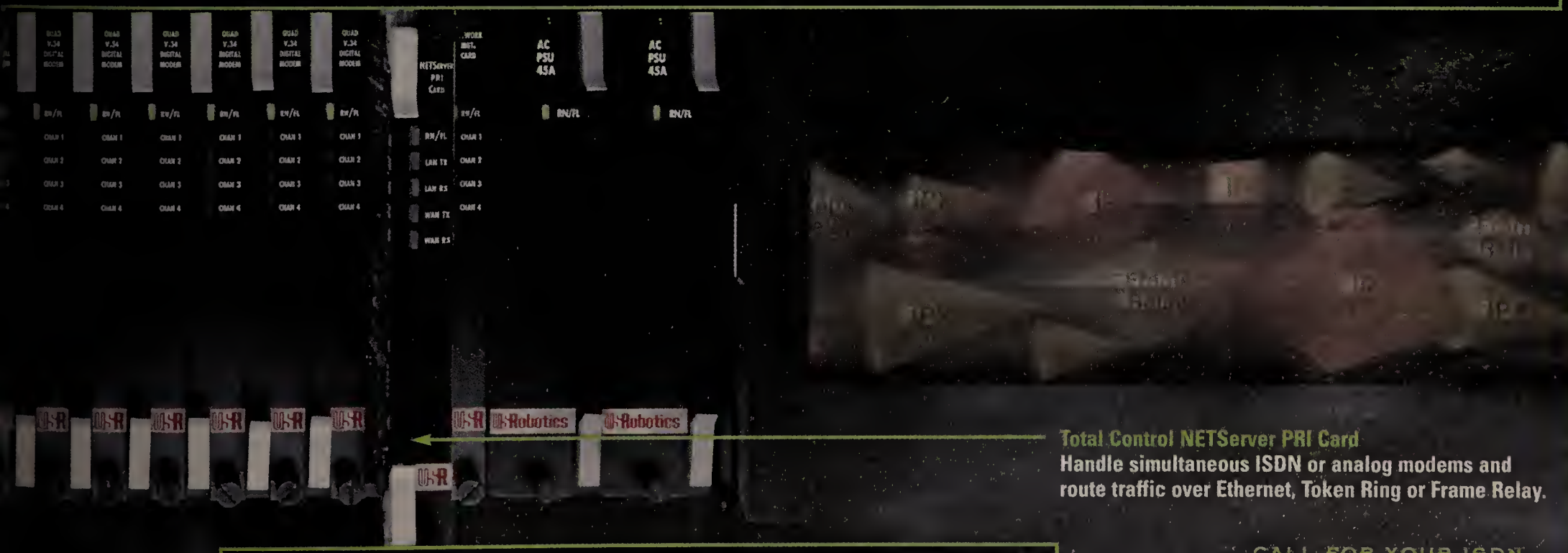
As more and more companies adopt Web technology internally, the browser-as-client trend is expected to continue. This is a bonus for software vendors, who will be able to simply provide the server application and assume that a universal browser will run the application, points out Geoffrey Bock, a senior consultant at Patricia Seybold Group, Inc. in Boston.

"It's easy to integrate a Web browser as a universal desktop client with back-end functions," Bock notes.

Without a doubt, a Web browser can open up brand-new horizons for innovative enterprise managers. Just release your imagination.

Jacobs is a consultant and writer based in Framingham, Mass. She can be reached via the Internet at pjacobs@world.std.com. ■

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Dr. Intranet

Continued from page 10

database interfacing. The site also demonstrates the power of marrying the convenience of Internet technology with the efficiency of data warehousing.

If you're not using a Web server that has a built-in method for database access, you'll need to turn to the Common Gateway Interface (CGI). This interface, which allows intranet masters to add functionality to most Web servers via stand-alone programs usually written in C or Perl, has come under fire lately due to performance issues. However, if you're not getting hundreds of hits a minute at your intranet site, a custom CGI database interface is a safe bet.

The second approach to providing database connectivity from the intranet involves layering online analytical processing (OLAP) functionality on top of a Web server. This enables true ad hoc querying, meaning users can interactively drill into a database or design custom queries from scratch.

On the downside, talk about adding OLAP functionality on the Web server is mostly just that right now; no real products are around. But two companies — Arbor Software Corp. and Microstrategy, Inc. — are close to rolling out OLAP tools for the Web.

If the demo is any indication, Arbor Software's soon-to-be-released Web Gateway to its Essbase database will be quite. Through a series of tables and forms, a user can travel deep into the data with great interactivity.

For example, after examining a table of sales by region for ABC Corp., I selected a region and drilled down to get a table of sales by sales rep. Clicking on a sales rep showed me that person's per-quarter sales. Microstrategy's DSS Web tool, will offer the same kind of functionality.

For more information on these products and OLAP, start at http://www.arborsoft.com and http://www.strategy.com.

If you need to provide complex data and drill-down functionality — and have several spare months to wait while the tools solidify — OLAP is the way to go. If your requirements don't call for that level of sophistication, the Web server-based solutions provide adequate connectivity between databases and intranets.

All this talk about intranets has got me confused. If I build a private Web, do I still need traditional client/server applications?

Traditional client/server software that accommodates messaging, data retrieval and group collaboration over a private network has been getting quite a bashing lately. The relative ease of building intranets has led many people to the conclusion that traditional client/server applications are too complicated and expensive to deploy and maintain successfully.

This view stems in part from the mad rush to establish a presence on the World-Wide Web: It has forced whole companies to become familiar with the new Internet client/server technology — Web servers and client browsers. This Internet push makes it pretty easy to build an intranet because it puts the know-how in place. In other words, IS already knows how to set up a Web server and, more importantly, anyone from a salesperson to a marketing manager to a top-level executive has become an browser expert.

Web software is relatively simple to understand and flexible enough to deploy across multiple platforms. What's more, if the Java programming language and application run-time environment actually live up t the hype, the functionality of an intranet would b extremely extensible since you can create progran that can be downloaded from a Web server and run o clients.

Dismissing traditional client/server software is all tc easy. When compared to intranet tools, it's much mo complicated, expensive and difficult to deploy across di ferent platforms. Nevertheless, it would be foolish t overlook its merits for mission-critical applications.

Intranets come with their own set of problems, such : security and employment of emerging technology subje to rapid changes. There's no arguing that they're gre for information retrieval and group communication, b at this point, you should probably stick with tradition client/server software for highly sensitive or mission-cr ical applications, such as accounting reports or hospit patient tracking.

Morro is a Web architect at Intersé Corp., a Sunnyva Calif.-based Web development firm. ■

Cover

Continued from page 36

within the intranet. A content team figured out what information goes on which internal sites, by department or location, for example. And Vander Wall's technical design team is plotting the architecture.

Then there's the question of maintenance.

"You have to have an owner, someone responsible for posting and maintaining content, and the content must be properly classified," Vander Wall said.

Another intranet consultant says the teamwork-facilitating technology is itself often designed and maintained cooperatively.

"We've found that there's an absolute demand for methodology, and that the Webmaster is usually a team of people – MIS and marketing folks – who have control over the intranet," said Patricia O'Hern, senior partner with Utopia, Inc., a Waltham, Mass.-based company that develops intranet and Internet sites.

Basically, the way corporations approach intranet management reflects their existing IT practices. Top-down companies like Boeing and The Chase Manhattan Bank, N.A., extend to intranets their procedures for acquiring, installing and using new technological resources. Internal and external Web projects are subjected to the usual budget process.

Practitioners of such policies offer the usual justifica tion: cost control, consistency of equipment, security concerns and "fitting in" with what's already in place. When an intranet goes into one of those companies, it role is spelled out.

"IS likes central control," said Paul Williamson, an advisory support specialist with Chase in Lexington, Mass. "We restrict what's out there if it's connected to the corporate net."

Less stringent IT policies mean an intranet may take the same route as early PCs, popping up within a department when a need is perceived. Proponents of a more liberal equipment installation policy contend the can act faster individually, be more innovative and me their needs – until, perhaps, they need access to the corporate database.

"Control of the intranet often comes down to fiefdoms and politics," consultant O'Hern observed.

Perhaps both IT and users learned something from the PC experience. Intranets don't seem to present th same arm-wrestling struggle that was common when users wanted microcomputers. Or, perhaps a significa portion of the current IT staff were themselves PC use a decade and a half ago.

"The crucial issue is not ownership, it's determining the business need and use of the technology," said Mi Sanchez, support technician with South Carolina Electric & Gas Co. in Columbia. Sanchez is quick to point out that he joined IT from the user community, so he appreciates their needs and frustrations.

Just as PCs came more securely into the corporate fold when they became networked, so renegade intranets are learning to cooperate with IT when their users want access across departments.

"And sharing information across departmental lines is where intranets are powerful," said Rob Laws, senio training specialist in Microsoft Corp.'s desktop and business systems division.

Intranets are riding the wave of enthusiasm generat ed by interest in the Internet and the Web. Certainly, they are sibling technologies, but intranets clearly belong to the corporation.

But this technology does seem to fit more neatly int the existing infrastructure than has been the case with recent revolutions. Intranet proponents rarely talk about tossing client/server systems, but offer feasible ways to link them. Intranets broaden the reach of E-mail. And even the mainframe can participate reasonably painlessly.

But the really exciting stuff still lies ahead, consulta Tebbe suggests.

"It's helpful, but how exciting is getting a procedure handbook on an internal Web site?" he says. "Teams sharing information, true online collaboration, confer encing, these are the meat and potatoes." And by mos accounts, IT expects to be serving it up soon. ■

Schlumberger

Continued from page 42

ing the software on Web servers, the company has eliminated the thousands and thousands of dollars in shipping costs it incurred every time it needed to distribute new software to its engineers, who are spread among 196 locations worldwide, Dowell's Stevens says.

"Each time we shipped the software, it cost between $30 and $50 per box. We have eight PC products and they go out at least once a year," she says.

Sims cites a biannual communications cost study that shows the intranet has had a positive impact on the corporation's bottom line. The most recent study, published at the end of 1994, shows that the intranet budget increased 20% during the two years studied. Despite the increase in that one component, overall communications costs, which included telephone, postage and courier charges, declined by 2%.

According to Sims, the communications costs for that period tallied about $100 million. So he estimates the intranet saves the company at least $2 million but probably more like $5 million in communications costs annually.

For Dowell, the ease and inexpensiveness of distributing software on the intranet means developers can revise the software as often as they need and the engineers can deliver better end products, Stevens says. The company previously could only afford to send out updates once or twice a year, so problems that surfaced were not always immediately fixed.

A matter of culture

In addition to facilitating work within a company, the intranet has spurred cooperation across Schlumberger product lines, Gutman says. "The businesses themselves have become far more open. They used to keep it all closed, on a need-to-know basis."

Now Dowell engineers can look up information on drilling techniques that Anadrill has posted on a Web server, for instance. They no longer have to go through the E-mail, phone, fax rigmarole that preceded the ability to quickly find the information on the Web.

The shift to this type of openness comes from the bottom, but upper management hasn't been slow on the uptake, Sims says. "They can ask a question and be referred to a Web server. This has brought about healthy changes in people's mentality."

Schlumberger is fortunate in that it never had a central data processing division to hamstring its ideal of an Internet-style network. "At Schlumberger, the MIS staff is so thin, you can't wait for it to do something for you," Sims says. "Being a bunch of engineers, people take matters into their own hands."

If they want a Web server, they can go to the Internet and download freeware software and build one. It's as easy as that. ■

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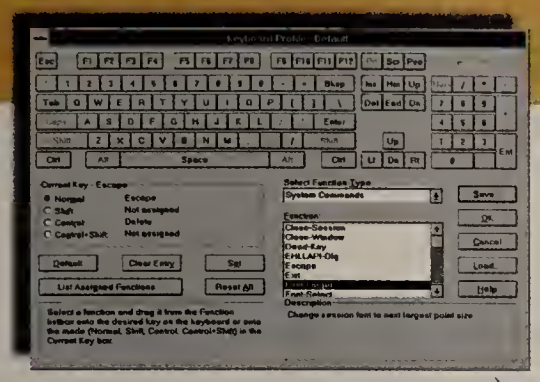
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Issue Date	Close Date	Bonus
July 15	June 14	Reader Service
August 12	July 12	Distribution at Managing Enterprise Networks/Boston, and Reader Service
Sept. 9	August 9	Distribution at NetWorld+Interop/ Atlanta & Internet Commerce Expo/ Anaheim, and Reader Service
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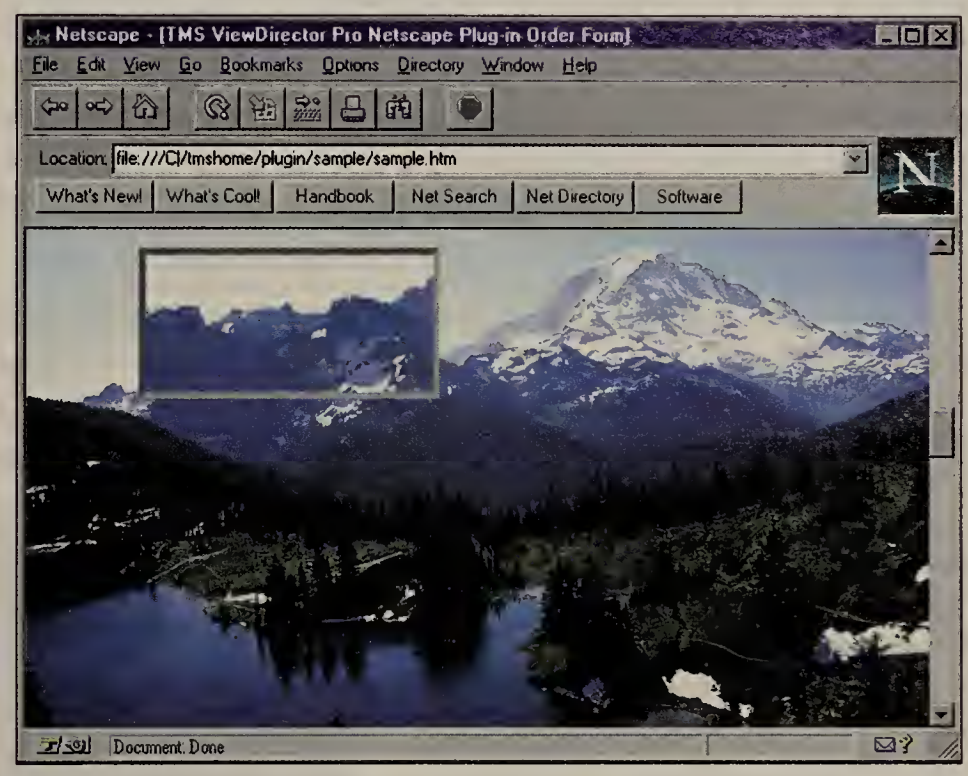
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WEBWARES



Dealing with terror

Here's a little trick that works well when something scares you: Don't call it by its real name. For example, if you're all alone reading a Stephen King horror story late at night and the flesh-eating, sadistic ghouls are making you jumpy, just substitute the words "waffle iron" for "ghoul." It would take a particularly nervous person to find something like flesh-eating, sadistic waffle irons at all frightening.

OH SURE, YOUR INTRANET IS FUN AND INTERESTING NOW... BUT JUST WAIT UNTIL EVERYONE ELSE GETS AHOLD OF IT.

You're probably wondering what the heck waffle irons have to do with intranets. Well, you may not think so right now, but one day your intranet is going to start looking rather ghoulish.

That's right. You're probably pretty pleased with your lot in managing the corporate intranet. You get to test out all sorts of way-cool products and control a new and powerful system — in short, life is good. But your nice lifestyle is going to come to an end.

The fact is that as the intranet becomes larger and larger, it will begin to drive you, rather than you driving it. Like the demons common to King's novels, the evolving intranet will shatter your peacefulness by turning into a screaming monster that threatens your sanity with its demands and then sucks out your brain — actually, not too dissimilar from what LANs did a few years ago. That's the price of success.



Now that you're starting to realize what you're in for, does the word "intranet" make you nervous? And just when life looked like it might be smoothing out. It kinda feels like a Prozac moment, doesn't it? Yep, thought so. (Move over, King.)

Well, to soothe the nerves of the more anxious among you, I'll now substitute the term "waffle iron" for "intranet" (oops, sorry) in the rest of the column.

You see, when a waffle iron starts, it has humble roots. A few documents on a skunk works Web server, no real back-end applications other than a few forms to send data via E-mail and that's pretty much it.

But as your company's waffle iron grows, that nice little gig you have running the thing will change rapidly. You're not going to get away with telling the head of human resources that you'll get around to putting up the department's data next month. That's not going to work with the heads of finance, shipping, development or, the CEO, either.

Many pundits recommend setting up formal committees and task groups, and establishing official guidelines for waffle-iron operation and policies for management. Yeah, right. And then you die.

Whether you like it or not, waffle irons are essentially anarchic. The tightly constrained waffle iron, on which the only things that can be done must go before a committee with paperwork filled out in triplicate and signed by the department head, then submitted to human resources with an affidavit certifying the author's mental health, will be a sterile, sorry thing.

Worse still, rigid, formal corporate waffle irons are boring. They may be useful, but that's it. Just think of your corporate network: If it wasn't for E-mail adding a touch of interpersonal relationships, the network would be just another tool.

The thing that makes waffle irons exciting is the opportunity for expression of corporate culture. Sure, pictures of somebody's newborn baby or announcements of the latest positions in a corporate bridge tournament may be of little interest to you and arguably of little direct relevance to the company's business. But what cynics overlook is the issue of community.

And online communities are powerful things. Some of the on-line communities are based on well-focused interests (for example, the vibrant community surrounding the Well or the computer-related newsgroups such as alt.comp.parallel) and sometimes by less tangible commonality. (The popular newsgroup alt.adjective.noun.verb.verb.verb is a sterling example of obscure commonality. Check it out, but if you don't get it, don't write to me — you're on your own.)

It is the sense of belonging that people crave and seek out. On a waffle iron, the same things apply: the ability to make contact, find common purpose, and most importantly, gossip. People like to swap stories and experiences and be connected. If you haven't done so yet, put a bulletin board service on your waffle-iron Web server (I've been trying out O'Reilly and Associates, Inc.'s WebBoard; test it out at http://www.-gibbs.com) and see how fast online interest groups form.

If you can enable and support staff interests as well as corporate goals, you will see a blossoming of online activity that will, in turn, stimulate and enrich the existing corporate culture. But decentralize control. If employees want to publish something, anything, let 'em. And let them have the right tools and knowledge. Let them have authority. Let them take responsibility. Let them eat cake — oops, got carried away there.

Also, don't get hung up on the look and feel of Web data created by staff. Sure, you must have rules for certain aspects of waffle-iron publishing, but don't try to enforce absolute uniformity. You'll fail. Just try being the Web police when you have 1,000 people publishing their own data.

As for whether you want to own your organization's waffle iron, I would suggest that you absolutely do; but do so by shaping and guiding corporate online culture rather than trying to control it. If you take this approach, you might even be able to start using the word "intranet" again.

Gibbs is editorial advisor for IntraNet Magazine. He can be reached at mgibbs@gibbs.com



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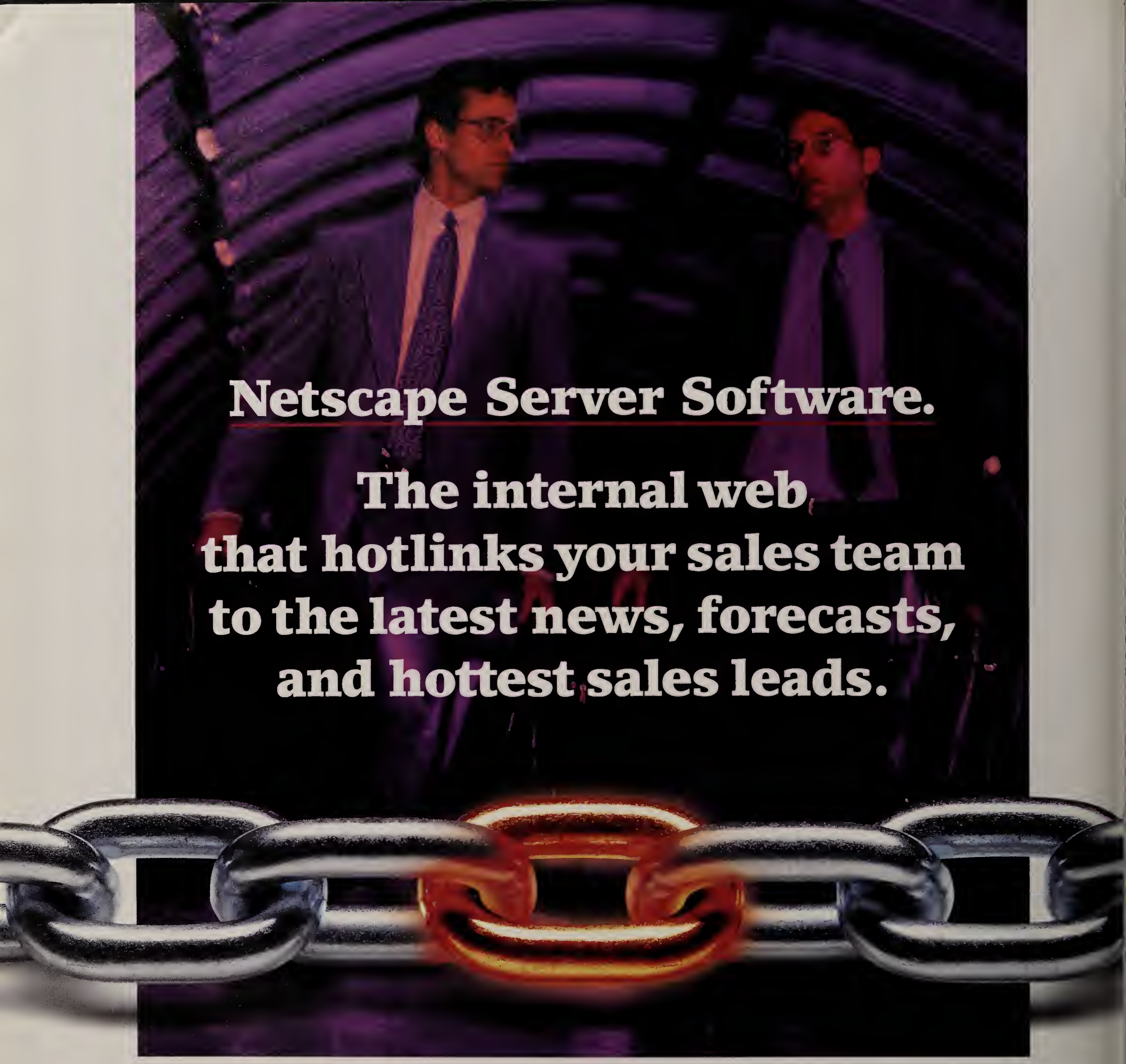
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Intranets & the 'Net

Covering: Internet Technologies and Services for Collaboration and Electronic Commerce

Briefs

■ *Austin, Texas-based* **Haystack Labs, Inc.** *has introduced WebStalker, a Web server security package that monitors Web servers for attempts to damage links or files, shutting down* **potentially dangerous connections** *when they are detected. WebStalker, which lets Webmasters implement a site security policy based on questions such as who has access to a Web server, costs $4,995. A version for Sun Solaris is available now, with versions for the IBM PC and Windows NT later this year.*

Haystack Labs: (512) 918-3555.

■ **The National Computer Security Association** *last week said that 16 firewall vendors have successfully completed its certification program for testing firewalls against a battery of attacks. The vendors include Atlantic Systems Group; Border Network Technologies, Inc.; Milkyway Networks, Inc.; Checkpoint Software Technologies, Ltd.; Digital Equipment Corp.; Global Technology Associates, Inc.; Harris Computer Systems Corp.; IBM; Livermore Software Labs International; ON Technology Corp.; Raptor Systems, Inc.; Technologic, Inc.; Trusted Information Systems, Inc.; Radguard, Ltd.; Sun Microsystems, Inc.; and NEC Technologies, Inc.*

■ *Teaming up with Reston, Va.-based* **CyberCash, Inc.** *in support of retail purchasing over the Internet, the National Bank of Canada last week announced it will provide* **secure credit card payment** *services to Canadian businesses and the CyberCash electronic wallet to consumers.*

■ **Megasoft Online, LLC** *next week will announce the Web Transporter, a client/server package that works as client plug-in to Netscape Communications Corp.'s Navigator to ensure that data files or software applications located on the Internet or a* **private Intranet** *are correctly received, configured and installed on the local workstation.*

Megasoft Online: (800) 222-0490.

Corporations to pave streets with Java gold?

By Ellen Messmer

The Java programming language is new and its development tools still few, but some corporations are already making the move.

These Java pioneers are seeking a way to foster platform independence, create interactive applications, and even lower the cost of processing on the desktop through use of the Java-enabled Network Computer (NC).

Fidelity Investment Co., First Union Bank Corp., the Lombard Institutional Brokerage and the Home Shopping Network are among the growing number of companies in the financial community investing in Java. And even governments are getting into the act: The Taiwanese government is licensing Java from Sun Microsystems, Inc. to promote it among Taiwanese equipment manufacturers.

"At Fidelity, there are now at least 30 separate Web-related intranet projects going on," said Bob Airasian, vice president of advanced technologies at the Boston-based investment house.

Airasian said Fidelity sees Java as the foundation for developing interactive trading, insurance, investment planning and stock-quote applications.

Fidelity is also ready to buy into the NC, the genre of Java-enabled low-cost devices promised by IBM and others as low-cost thin clients. "We spend millions of dollars on PCs on an annual basis," Airasian said. "After a while, the cost is staggering." Fidelity plans on using the diskless low-cost NC, which can call Java applets from a server, in its call-processing centers, which are due to debut later this year.

"We have 4,000 people answering 800-number calls," said Airasian, pointing out that a customer representative using a PC to do terminal emulation or a graphical user interface for 3270 datastreams is computer overkill for the job that the call center staffers perform in reviewing customer records and making simple entries.

Java is jumping on the Internet, too. First Union Bank has prepped a Java applet for its Web-based cyberbank opening this month on the Internet.

Michael Yakel, vice president of emerging technologies for First Union, said the applet, developed by Andersen Consulting, will let customers download their account information and interactively conduct bank business online.

However, Java applications and applets are known to run as much as 20 times slower than comparable C++ applications, so performance is an issue.

Customer bandwidth is also a concern, Yakel said, because using the Java applet can involve one to three minutes of download time. Therefore, First Union is carefully watching the progress of the Java microchips and just-in-time compilers promised from many vendors to speed Java processing time.



Lombard's *Macllwane (above) and Home Account Network's Brewer envision a future filled with Java.*

San Francisco-based Lombard last year began letting customers make stock trades and get stock quotes over the 'Net via the company's Web site. More recently, Lombard added a Java applet to its Web server that lets customers get more dynamic stock information and analysis.

"Java will make an incredible increase in the empowerment of the user. It will affect the ability and the interest in effecting a transaction, and that's what brokerages want," said John Macllwane, director of information systems for Lombard. But Lombard does not envision a Java applet for trading stocks until Sun has a comprehensive security scheme in place for Java.

Dave Brewer, chief technology officer at the Home Account Network, a systems integrator that develops online home-banking applications for financial institutions, said his company is now evaluating Java as a replacement for C++ due to strong interest in it from its client base.

"Software distribution can be done easily by distributing it off a Web server using Java applets," Brewer said. ■

Security

Server software module safeguards Web images

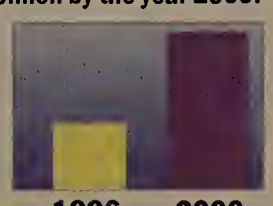
By John Robinson

A California company wants to make unauthorized use of electronic images mission impossible for Web pirates.

Irvine-based Maximized Software, Inc. last month released SiteShield, a Web server plug-in module that scrambles selected images when users download them to a Web browser.

Web server tsunami

The market for Web server software is expected to be $750 million this year and grow to over $7 billion by the year 2000.



SOURCE: FIRST ALBANY TECHNOLOGY RESEARCH

Maximized designed the module for Netscape Communications Corp., Microsoft Corp. and Apache Group Web servers, but company officials said support for other servers may be incorporated as the market continues its explosive growth (see graphic).

To use SiteShield, Webmasters need only select the images they want to protect through the module's configuration files. The module attaches a header to the image and intercepts files as they are requested. Finally, it translates those images into a protected format, said Howard Fram, product manager.

While the image file can still be saved locally, it cannot be displayed.

"The image does not appear any different on the Web site and doesn't affect browsing," Fram said. "You could mark that an image is protected on your site, but that might be viewed as a challenge to some hackers."

Fram acknowledged that ambitious hackers could decipher a protected image, but said SiteShield should discourage most users from attempting the task.

By blocking domain requests, SiteShield also prevents users from referencing content from other Web sites in their own HTML.

"People want you to come to their site, especially if they have advertising, and don't want their content [linked] to other people's Web sites," said Ken Spreitzer, president of Maximized.

In addition, the SiteShield module includes a content selection function that lets Web servers provide different pages for different browsers. For example, if a page contains several Java applets and a request arrives from a browser that does not support Java, SiteShield will default to another page.

The beta version of SiteShield for Netscape on Windows NT is available now online (http://www.maximized.com). A demonstration of SiteShield can also be accessed at the site. Final versions for Netscape, Microsoft and Apache Web servers are due out next month and cost $500.

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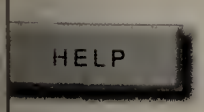
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"Funny,
I thought my
job description
said
MIS manager
not

test pilot."



Uh-oh. It's time to start designing a client/server network. All in the line of duty, of course. The trick is to do it somehow without risking your life.

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Microsoft Windows NT Server

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Technology Update

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NETWORK DESK

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We are in the process of instituting a WAN among three corporate sites, each of which has Novell, Inc. NetWare 4.1 servers with Novell Directory Services (NDS). I am concerned about issues like NDS synchronization, handling protocols such as the Routing Information Protocol (RIP) and Server Advertisement Protocol (SAP), and the bandwidth required for the WAN. The NetWare manuals haven't been much help. Do you have any suggestions?

Vladimir Lauture, Sasaki Associates, Inc., Watertown, Mass.

You can do several things to keep NDS traffic from saturating WAN bandwidth, says Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area. For one, go into the servman.nlm file and tell each server where it needs to go specifically for time synchronization information, he says. This will reduce the use of SAP. He also suggests implementing the NetWare Link Services Protocol so that RIP information is only sent across the network when it changes.

Nutter also notes that you can keep the chattiness of NDS to a minimum by placing each server in its own partition within the NDS tree and eliminating read/write replicas of the other partitions on the local server.

In determining bandwidth requirements, closely evaluate expected traffic, Nutter says. For electronic mail and small file transfers, a 56K bit/sec leased line should suffice. For large files, such as computer-aided designs, or remote host access, frame relay is worth considering, he says.

In tandem, look carefully at data service units/channel service units (DSU/CSU), Nutter says. DSUs/CSUs for 56K bit/sec only cost around $200, but it might be better to invest in more expensive software-configurable modems that adapt to higher line speeds, he says.

If you want more material, Nutter commends a book called *NDS Troubleshooting One* and the Novell course, "Internetworking with MPR."

RMON2 delivers standards-based seven-layer network monitoring

By Ben DeBolle

The day when network managers can get a complete, end-to-end view of network traffic in a standards-based format is growing closer.

The IETF continues to push the Remote Monitoring 2 (RMON2) Management Information Base (MIB) specification through its approval process. The spec now awaits a request for comment number and will then enter the IETF's standards track. In the meantime, many vendors already are offering products with RMON2 features.

The performance benefits of client/server architecture can be great for the user in the workgroup. Client/server, though, can represent a significant challenge for the network administrator, especially as newer, more sophisticated technologies, such as LAN switching, are added to the network.

Fortunately, many network managers have found a friend in the RMON standard. The RMON MIB utilizes the Simple Network Management Protocol to provide traffic analysis and troubleshooting of switched internetworks.

Although RMON is widely accepted as an effective network management tool, it suffers from one major limitation: It only specifies monitoring and diagnostics for network traffic at the media access control (MAC), or data link, layer. This means RMON agents cannot identify network hosts and sources beyond the router connection.

A bigger picture

The emerging RMON2 standard addresses this limitation. With RMON2-based agents and probes, the network manager will have full seven-layer visibility and analysis capabilities.

RMON2 agents can identify traffic at the network layer, and by using network layer addresses, enable network managers to monitor statistics sent out by the actual endstations for all hosts connected to a network segment or switch port. This differs from an RMON agent, which can only gather statistics based on MAC layer addresses that provide visibility only to the first router interface.

The RMON2 MIB provides detailed statistics, host and matrix conversation tables for major network layer protocols, such as Apple Computer, Inc.'s AppleTalk, the Internet Protocol and Novell, Inc.'s IPX. With such information at their disposal, network managers get a complete, end-to-end view of network traffic.

In addition, RMON2 defines monitoring of application layer traffic so network managers can profile and analyze network applications. Administrators can outline logical filters that instruct remote agents to capture statistics from a particular application type.

With this capability, network managers can now proactively monitor and troubleshoot any key application layer traffic, such as File Transfer Protocol, HyperText Transfer Protocol, Network File System and telnet, within the enterprise network. RMON alarms, statistics, history and host/conversation groups are now usable for monitoring application layer traffic, providing the most user-oriented view of network traffic.

In the details

In addition to enabling creation of network and application layer host and matrix tables, RMON2 enhancements include:

- Address mapping for indicating MAC-to-network layer address bindings. With RMON, MAC addresses are not mapped to the more familiar and recognizable IP addresses, so it is difficult for a network administrator to discern an endstation's location.
- Protocol Directory and Distribution groups for displaying selected higher layer protocols and related statistics. With RMON, network managers simply see Ethernet frames, for instance. RMON2 indicates what types of packets are traversing the network.
- User-definable history, which now extends beyond RMON link-layer statistics to include any integer-based RMON, RMON2, MIB-I or MIB-II statistic. For instance, a network manager can use RMON2 to keep a history of utilization, broadcast rates and errors on one switch port while just looking at errors on another.
- The definition of methods for remotely maintaining and configuring probes for trap messages, modem communications and software updates. This means network managers can configure and gather information from disparate vendors' devices in a standard fashion.

Research the RMON2 standard further on Network World Fusion. Select NetRef, Technology Resources then Network Management.



Beyond RMON2

In addition to supporting the basic RMON2 standards, vendors will enhance their offerings with additional functionality. For instance, extensions for monitoring virtual LANs will provide additional visibility into high-performance switched internetworks and Asynchronous Transfer Mode networks. Over time, this additional functionality will be addressed in a new standard, perhaps called RMON3.

In the meantime, network administrators can rely on the standards-based RMON2 MIB to better monitor and manage their networks.

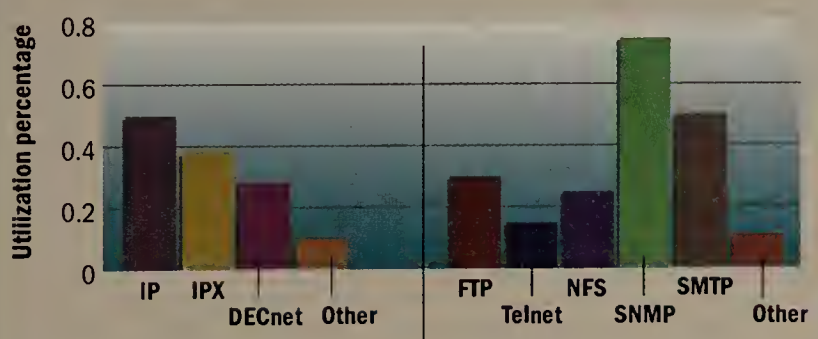
It represents a major step forward for network administrators who must consider new ways to collect and interpret network traffic data in a switched environment.

DeBolle is a product-line manager at Cisco Systems, Inc., a router and LAN switch vendor in San Jose, Calif.

UP CLOSE

Getting traffic stats

RMON2 goes beyond the capabilities of its predecessor, RMON, by specifying a way for agents to gather traffic information at the network and application layers. These statistics can be charted and analyzed.



This graph reveals that IP, IPX and DECnet account for 0.5%, 0.28% and 0.38%, respectively, of all Usenet traffic on the network. A net manager could use this information to determine how much bandwidth to allocate for each protocol.

This graph shows that SNMP dominates the application traffic flowing across the network. A net manager could use this information to determine what percentage of Ethernet bandwidth is being taken by a particular application.

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Beth Schultz by phone at (312) 283-0213 or via the Internet at bschultz@nww.com.

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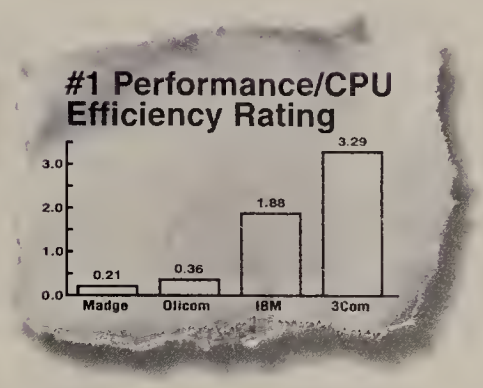
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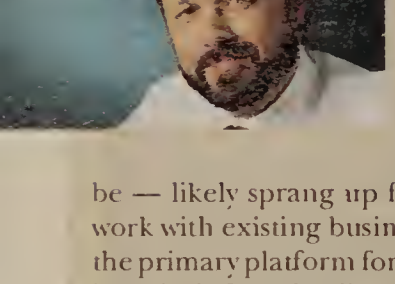
EDITORIAL INSIGHTS

Hands off? Or on?

With the launch of *IntraNet Magazine* — the first issue appears after page 36 — intranets weigh heavy on my mind.

There's no shortage of technology hurdles to overcome when building intranets, such as managing them in the absence of any solid tools or linking them to existing databases and applications. But what's really got me scratching my head is the nontechnical issue of intranet policies — as in, should you have 'em?

Purists argue that, for the intranet to thrive, IS should leave it the hell alone. In fact, Mark Gibbs, in his *IntraNet Magazine* column, makes a strong case for such a hands-off approach. "The tightly constrained [intranet], on which the only things that can be done must go before a committee with paperwork filled out in triplicate and signed by a department head, then submitted to human resources with an affidavit certifying the author's mental health, will be a sterile, sorry thing."



I hate to, but I beg to differ. This can only come across as draconian, but you have to quickly establish standards on intranet use and information posting and make sure everyone knows them.

Why? I worry about the future. Your intranet — or intranets, as the case may be — likely sprang up from the grass roots. But intranets will work with existing business applications, perhaps even become the primary platform for those applications. What's appropriate in today's freewheeling environment may not work when your intranet is serving an entire company, even business partners, in a politically correct world. (One cartoon, done in bad taste and posted by some cutup, could cause a world of hurt.)

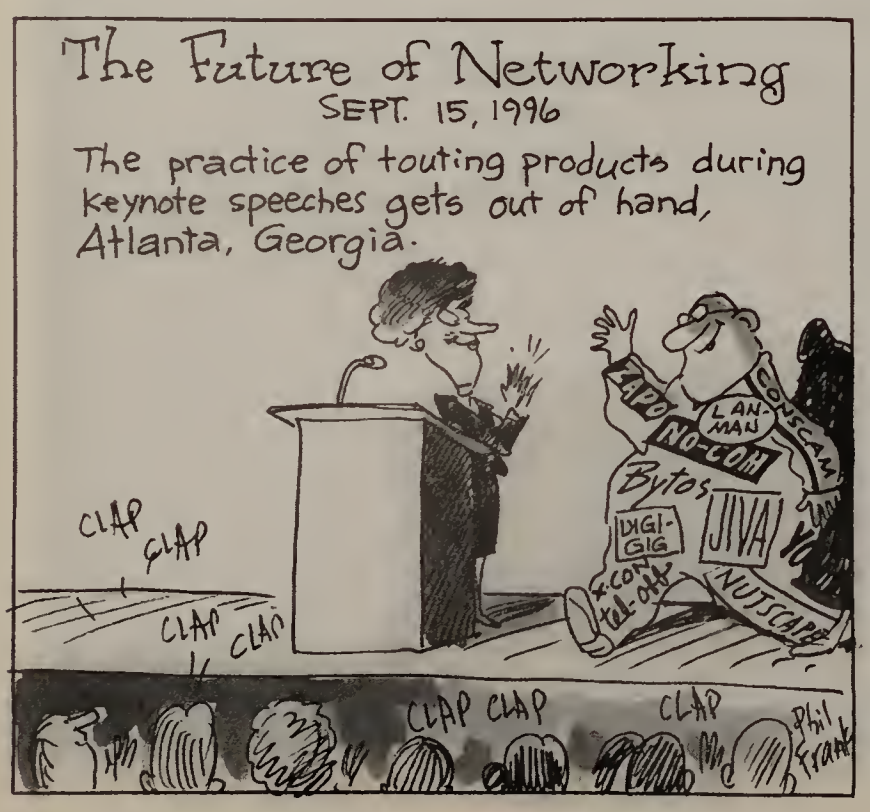
The longer you wait to make clear what is and isn't appropriate for intranet use, the greater the backlash you'll encounter from end users who've grown accustomed to using it as they please. (An analogy here is the Internet, where the government's appropriate-use policy — the ill-conceived Communications Decency Act — is raising the hackles of 'Net users.)

Believe me, I'm not talking about creating some multipage legal document that spells out every possible inappropriate use of technology. But you need to lay out in clear terms that intranets — like phones, E-mail and voice mail — are business tools. Sure, intranets can build community, but keep in mind where they are going and head off any problems before they arise.

John Gallant, editor in chief jgallant@nww.com

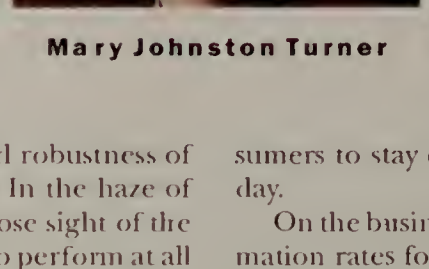
Teletoons

By Phil Frank and Joe Troise
guru@well.com



NETWORK CONVERGENCE

Changes are in store as carriers struggle to keep up with demand



Mary Johnston Turner

Internet brownouts, carriers running out of phone numbers, communications crises looming at every turn. A quick review of the recent networking news sets off alarms about the telecommunications industry's ability to keep up with demand.

Clearly, the unanticipated growth of networked computing and communications is having an impact on the reliability and robustness of our core telephony infrastructure. In the haze of Internet hype, it has been easy to lose sight of the fact that the Internet's very ability to perform at all is dependent on the basic stability of the underlying public carrier networks. Switched and dedicated circuits, telephone number-based routing and seamless carrier-to-carrier interconnection agreements are all required for you to be able to access your favorite Web page.

As the Internet has exploded, traditional carriers — particularly the local exchange carriers (LEC) — have been struggling to adapt to totally new traffic models and to develop data-oriented capacity forecasting tools. While the average voice call lasts a few minutes, the average data call can last hours.

Unfortunately, flat-rate residential pricing never envisioned this type of network demand. It's hard to find the money to invest in rapid upgrades of infrastructure when the rates that support that investment remain static.

Competitive access providers and alternative technologies, such as wireless (and perhaps cable television), threaten to skim off the most profitable business, leaving the low-margin lifeline services for the traditional players. The LECs' finances are even further threatened as interexchange carriers such as AT&T and MCI Communications Corp. seek out new local access outlets, cutting deeply into the access charges that constitute as much as 40% of LEC revenue.

Soon, something is going to give in the battle between user demand and carrier network investment capabilities. Already, LEC mergers designed to improve economies of scale are being announced. However, consolidation of carrier operations alone is unlikely to do the job.

Three other major changes are likely. First, Internet service providers may be required to kick in an access charge to help pay for the cost of upgrading the public telephone infrastructure via some type of access charge plan. (The Federal Communications Commission has announced an investigation of this idea.)

Second, the traditional carriers may begin to offer variable levels of service quality and targeted service bundles and discounts. For instance, if you buy wireless and video services, you may get off-hour Internet access for free.

And today's one-size-fits-all residential flat-rate plans may be replaced by a wide range of offers. For example, you might still get flat-rate, unlimited calling service, but you may suffer from busy signals during peak periods. However, if you subscribe to a usage-based service, your call will connect the first time.

This strategy is essentially a way of using price to ration limited bandwidth. If you can't build more facilities, find a way to maximize off-peak use and charge premiums wherever possible. Time-of-day discounts already serve the same purpose — cheaper prices at night and on weekends encourage consumers to stay off the phone during the business day.

On the business side, different committed information rates for frame relay service are offered at different price points. You can expect much more creative use of pricing and service bundling to target offers to specific customers.

Third, carriers may begin to design networks to lower levels of reliability and redundancy. Rather than specifying that all network equipment have a 30-year useful life, carriers may opt for equipment with only a three- to five-year useful life. And instead of developing custom support and billing systems, carriers may use off-the-shelf software — it may be more buggy, but it's also cheaper and more readily available.

In reality, it's likely that elements of all three of these alternatives will be implemented. Most carriers I talk to are looking to a combination of regulation, pricing/packaging, and infrastructure reengineering to get them out of the current demand/resource crunch.

It's time to be extremely creative about the terms of your carrier agreements. Everything will be negotiable.

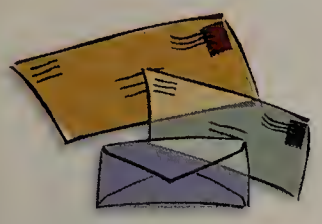
For network managers, the rule of thumb should be "Let the buyer beware" — particularly if you have major corporate contracts or bulk discount arrangements coming up for renewal within the next two years. It's time to be extremely creative about the terms of your carrier agreements. Everything will be negotiable, from service levels and availability to one-stop-shopping deals for bundled access and long-distance services from one carrier. Expect to negotiate local-loop costs the same way you negotiate long-distance rates.

Many types of deals, in many shapes and sizes will be put on the table during the next two years. Look carefully at the assumptions that underlie any proposal. Beyond the usual volume discounts, are there extra charges for traffic that exceeds predefined time-of-day volumes? Is that good rate you'll receive tied to a lower grade of service? The difference between 99.99% and 99.90% network availability may or may not be a big deal for your organization — make sure you know your priorities.

Finally, make sure your preferred carrier is one you feel will be around long enough to deliver on its promise. The next few years of creative innovation will be followed by a shakeout. A deal that looks too good to be true may be just that.

Turner is a vice president with Northeast Consulting Resources, Inc., a Boston-based consulting company. She can be reached at (617) 654-0619 or via the Internet at turner@ncri.com.

MESSAGE QUEUE



Well served

We really appreciate the work you are putting into the new Server Review series. This is exactly what your publication needs.
Alan Atkinson
Network administrator
Franciscan Estates, Inc.
Rutherford, Calif.

Money talks

In James Carlini's opinion column "Pork Chop Bill: The Telecom Act of 1996" (April 15, page 39), one point deserves clarification: Many local governments did participate in the legislative process concerning protection of right-of-way authority.

Unfortunately, Sen. Larry Pressler (R-S.D.) and the other key members of the Senate Commerce Committee were able to steamroll the "limited local involvement" position throughout the bill.

The bottom line is that cities and counties could not play the high-stakes lobbying game in the same stadium, much less on the same field, as the RBOCs and others.

My city was not able to make a fat contribution to Sen. Pressler's political action committee, so we were escorted out the door.

The only recourse is in the courts, where local authority to manage public property has solid legal footing, although the funding to carry out an assortment of legal challenges is questionable.
Harry Haasch
Cable administrator
City of Ann Arbor, Mich.

Questionable humor

Your "Career Land" game had some excellent ideas and was generally pleasant to read (April 29, page 100).

However, the joke item advising readers, "If all else fails. . .accidentally erase the complete password file or. . .Notes database the day before the 10th anniversary of your hiring or get a hacker to break into your network" was inappropriate and unprofessional.

Ask yourself: Would a banker's trade journal include in its version of Career Land a joke such as, "If all else fails. . . embezzle huge funds from the bank," or would a cardiologist's trade journal say, "If all else fails. . . prescribe fat and inactivity for your patients?"

Come on. Be professional, even in humor.
Dick Heyman
Network analyst
Symbios Logic, Inc.
Fort Collins, Colo.

I am appalled that you would suggest in your "Moves to Make" list that readers "accidentally erase the complete password file."

Our profession requires solid professionals with a sense of morality and respect. If an employer does not treat you right, you have a choice to find a new job. But it is not right to be a personal judge and jury. Our industry cannot be successful in a vigilante environment.

Can you imagine what would happen to an individual caught doing what you suggest? Not only would daily business be disrupted, but careers would be ended by firings and hard-won trust would be lost.

You must do better. If you can't, I bet *Network World* won't survive for another 10 years.
Leon Rippel
Agency data processing manager
Office of the Treasurer
State of Connecticut
Hartford



Client/server lives

I really enjoyed your anniversary issue. Several articles were terrific, including "Career Land" and "Two Decades of Network Technology" (April 29, page 104).

I strongly agree that client/server computing is among the top 10 critical technical developments of the past 10 years. Recent articles in other periodicals that state client/server is dead, a failure or a disappointment are bunk. Thanks for your positive statements.
Jim Fox
Director of information systems
Union Pacific Railroad
Omaha, Neb.

Texas touts telecom

Scott Bradner's column "Thinking local in global world" (May 13, page 19) prompted me to write about our experience in Austin, Texas.

Taking data and information and turning it into knowledge is one of the most critical challenges facing communities today. In a move to keep Austin's communications policy proactive, Austin/Travis County and the State of Texas recently joined forces to ensure that all citizens will have access to the National Information Infrastructure.

Construction has begun on a fiber-optic cable network linking virtually every local and state government office in Austin. The $15 million Greater Austin Area Telecommunications Network, to be completed by the end of 1996, will provide telephone, data and video services for seven members: the Austin Independent School District, Austin Community College, the City of Austin, the Lower Colorado River Authority, Travis County, the State of Texas and the University of Texas at Austin.

The 285 miles of cable connecting more than 300 public facilities will be the largest cooperative telecommunications system in the nation. More importantly, Austin students will be able to use the network for everything from accessing library materials located across town to communicating with electronic pen pals around the world.

Technology is a gateway not only to the future, but also to the past.
Jimmy Castro
Member
Greater Austin Chamber of Commerce
Texas

Shared blame

The "darkside hacker" problem (May 6, page 1) is actually twofold. It typically consists of a young person who has been lured by the "dark side of the force" and a systems administrator who is basically clueless.

I can think of no reason why, for three years, u4ea has not been caught. The technology exists to track and record the activities of this type of hacker and make him cease and desist.

One problem is that most companies try to keep a security breach quiet and handle it internally. That is not an effective solution to the problem. Just as there are heart specialists, there are network and system security specialists. Yes, a heart specialist costs a bit more than a general practitioner, but when one needs a specialist, one should go to a specialist.

Who is to blame? Both the hacker, for doing something illegal, and the systems administrator, for allowing the illegal activity to occur or continue.
Rich Andrews
Unix and network security consultant
Unixconnections
Dallas

ATM overdose

I am getting tired of seeing ATM stories on your front page ("Fiesty Fore takes a shot at desktop ATM," May 20, page 1). Can't you be more creative?

Who in their right mind is going to install 25M bit/sec ATM to the desktop when you can do voice, video and data over IP, or by using switched Ethernet, Fast Ethernet or other more creative variable-length packet-switching techniques coming our way? Why is that front-page news?

Cover Network Computers, cover the emerging broadband networking alternatives in the last mile from cable TV and wireless companies, cover the new Internet switching points on the East and West Coasts. ATM is there, but it is not the main story.

Give me a break from this "ATM is the future" party line. You don't have a crystal ball, and many top networking professionals do not believe that ATM is the future.
Ed Moura
Vice president of network systems
Hybrid Networks, Inc.
Cupertino, Calif.

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Feature

Stretching those budget dollars

NW SURVEY SHOWS BASICS LIKE NET MANAGEMENT AND INTERNETWORKING ARE HIGH ON THE LIST

By Elisabeth Horwitt



Despite continued pressure to run lean and mean network operations, many corporate users are opening up their wallets when it comes to a couple of core areas: network management and internetworking.

When asked what areas of technology will get significant budget increases next year, 17.6% of respondents to *Network World's* 1996 Budget Survey cite network management tools, while 16.8% indicate LAN/WAN networking hardware or software. Another 12% indicate Asynchronous Transfer Mode equipment or service will take a much larger budget bite next year, while more than 8% say the Internet will. These numbers increase in significance given that it was an open-ended question, meaning respondents were not prompted for answers in any way.

On the other side of the coin, only 2.3% of respondents to the same question say they will spend significantly more on client/server projects. Meanwhile, 4.6% plan to spend more on PCs; 4.6% on Windows NT; 3.1% on Windows 95; and 3.8% on NetWare. A total of 161 readers participated in the survey.

Both sets of numbers reflect a recent shift in which the IT budget allocation process has become less a matter of IT "selling" technology to upper management than of joint IT-management decisions based on business imperatives, analysts and survey respondents concur.

"Anyone who goes for client/server for client/server's sake is in real trouble," says John Mann, a research director at The Yankee Group consultancy in Boston. "If you don't focus on business problems all the time, you really mess up."

Daniel Grube, a network administrator at industrial valve manufacturer DeZurik Corp., agrees. In the past, IT would say, " 'We need this for some technological reason,' like faster backups, so we would invest in the latest backup scheme," Grube says. A recent management change, however, brought in a new president with a different way of doing things. "He says, 'These are our strategic goals, and everything we do must relate and have a sense of urgency.' "

David Roggenbauer, IS manager at Berlin Foundry Corp., says his local management asks IT, " 'Will [an IT budget item] help the company produce a product better, faster, cheaper?' "

For the moment, at least, the answer to that question is a resounding yes when it comes to spending on LAN/WAN infrastructure.

"The network is becoming as important as the data that flows over it," says Paul Brown, director of network operations for Helix Health. The Baltimore health care group has already spent $2.5 million to outfit its network with "WAN links scalable up to DS3 [45M bit/sec.] and fiber throughout the organization," Brown says.

Likewise, Carlson Wagonlit Travel is "in growth mode, moving to frame relay for support of distributed processing applications we'll roll out in the next year or so," says Steve Horve, director of network field services for the Minneapolis travel agency.

Easing the strain

Even as their nets are growing, respondents also point to a general trend toward shrinking staffs, putting them in the age-old position of having to do more with less. That's a major reason respondents gave for investing in network management tools that increase the productivity of systems administrators.

What's hot right now are "point solutions and applications [particularly in the help desk area], barebones SNMP platforms and tools to manage the network infrastruture," says David Passmore, president of Decisys, Inc., a Sterling, Va.-based consultancy.

DeZurik, for example, plans to implement Novell, Inc.'s systems management platform, Managewise, Grube says. Helix recently upgraded to Intel Corp.'s LANDesk 2.5 and is adding a software layer for doing distributed workstation management across the enterprise.

Another recently entered budget item at Helix is a full-time network administrator. With the network carrying business-critical data, "we need to spend the effort to manage the network proactively," Brown says.

On the other hand, firms are still not willing "to spend megabucks on glorious, all-seeing enterprise platforms, which have not lived up to expectations," according to Passmore.

At Berlin Foundry, for example, "network management, particularly performance monitoring, is real important," Roggenbauer says. However, "if you find a product with the features you want, you have to pay $10,000. We have to produce a lot of castings for $10,000, and how do we justify it?"

The Internet, too, is responsible for lots of budget growth. In addition to the 8.4% of respondents who cite the 'Net as an area where spending will increase significantly next year, 7.1% say the Internet is the driving force behind major budget increases in various other categories, from NT upgrades to ISDN modems.

"We are looking at the 'Net closely as a medium to augment communications with our franchises," Horve says.

The travel agency is also looking at using the Inter-

net to check supplier inventory, such as flight seats or hotel room availability. One possibility is to provide a service that gives corporate clients direct access to inventory information over the 'Net, eliminating the costs of having human operators in the middle.

"The 'Net looks more cost-effective than putting franchisees on our private corporate network," Horve says. "Plus, the franchisees get the added value of being on the Web."

Intranets, too, have many companies rethinking their budget plans.

A primary reason companies are holding off on major client/server and groupware initiatives is they are taking the time to evaluate intranet alternatives, Passmore says. And with good reason. "A combination of [SMTP-based] E-mail, Web servers, newsgroups and threads services" constitutes a groupware platform that is "much more standards-based, and often much less costly than Notes," he says.

Indeed, to the open-ended question of which technologies will get a bigger chunk of budgets next year, only 1.5% of respondents mention Notes.

Follow-up interviews indicate some respondents are holding off on groupware and other major client/server implementations while they wait for key technologies to mature and stabilize.

Carlson, for instance, was "looking to move to a groupware/messaging platform about a year ago," but is still in the process of evaluating Microsoft Corp.'s Exchange vs. IBM/Lotus Development Corp.'s Notes, Horve says. "We haven't made up our minds yet because of Exchange's lateness," he adds. Exchange just shipped a few weeks ago after repeated delays.

Lack of business incentive is one main reason why companies are holding off on, or at least taking a gradual approach to, corporatewide client platform upgrades — particularly a costly one like Windows 95 (see story, this page).

But that doesn't mean nobody's taking the plunge. Those respondents who are in the midst of corporatewide client/server migrations tend to cite two main justifications for such major expenditures.

The first is return on investment: The standardization of client/server software across the company will cut end-user support, operations and management costs over the long term.

The second is the need to support competitive, business-critical applications.

In the health care industry, for example, companies are spending freely on client/server and networking technology to support applications that will provide that crucial edge, Helix's Brown says. The health care group will probably be "spending double what we anticipated spending two years ago" to replace proprietary host systems with a consistent client/server platform based on IBM and Sun Microsystems, Inc. Unix servers and Pentium PCs.

The new infrastructure will support a consistent set of applications and data querying features that give users access to patient and administrative files from every location in the health care complex, Brown says. This, in turn, will enable Helix groups to provide "a continuum of care" throughout a customer's life cycle, a competitive hot button in the industry.

Luhr Jenson & Sons, Inc. just jacked up its IT budget from less than $50,000 last year to between $250,000 and $500,000 this year in order to migrate from an obsolete IBM System/74 host to a client/server installation based on Microsoft's NT and Windows.

"I don't think budgets will ever go down to former levels — particularly next year," when desktop installations will have to be upgraded to support the software, says Terry Nickerson, LAN manager for the fish and tackle manufacturer.

Driving the initiative is the need to implement electronic data interchange connections with major distribution and marketing channels, Nickerson says. Major distributors such as Wal-Mart Stores, Inc. and Kmart Corp. are telling their suppliers to support EDI or they won't do business with them.

The Hood River, Ore., manufacturer is also implementing PC LAN-based software to better manage manufacturing

PAY ME BACK

The average payback period required to get approval for major network projects or equipment purchases is 16 months.

Over the past two years:

61% said the payback period has stayed the same.



23% said the payback period has decreased, by an average of 36%.

16% said the payback period has increased, by an average of 30%.

NETWORK BUDGETS – THE BIG PICTURE

Average voice/data/video operating and capital equipment budgets.

1996 **$11.4 million**

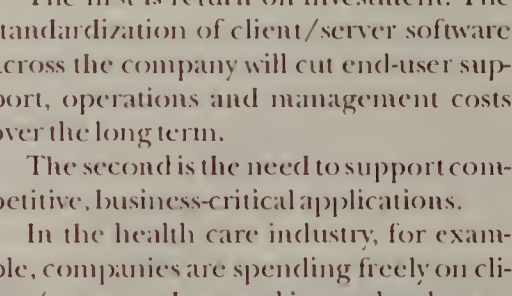
1997 **$12.4 million** (a 9% increase)

Where it's all going

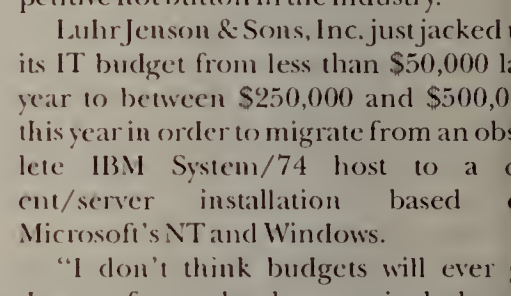
	Salaries	Training	Travel	Overhead	Services/ consultants	Line charges	Equipment maint.	Software or leases
1996	32%	6%	5%	7%	7%	13%	10%	20%

Projected 1997 breakdown is virtually identical

1996 budget breakdown – operating expenses



1996 budget breakdown – capital equipment/ software



Survey methodology

Network World's 1996 Annual Budget Survey is based on 161 completed responses from a random sampling of subscribers. The survey was distributed in March.

Survey data was tabulated only for those readers who have budget responsibility for network or data communications and telecommunications functions, and who work at companies with an estimated network spending of $1 million or more.

The survey was conducted by Research Concepts in Berlin, Mass., under the direction of Ann MacKay, the company's president.

Windows 95: A real budget buster

Launched with tremendous fanfare last year after a prolonged period of beta testing and general hype, Microsoft Corp.'s Windows 95 still doesn't seem to be making a dent in user budgets.

Survey numbers and respondent interviews indicate that many companies just can't see the business justification for budgeting a wholesale, immediate migration to Windows 95.

In an open-ended survey question asking what technologies or products will get significant spending increases next year, only 3.1% say Windows 95; another 4.6% indicate Windows NT.

Part of the reason is that IT decision-makers don't see how Windows 95 provides "real value, giving users something they didn't have before," says David Passmore, president of the consultancy Decisys, Inc. in Sterling, Va. "Mostly what companies see is the huge cost: the need to get more memory, more powerful machines, plus labor costs of deinstalling and debugging."

Companies do not seem to be rejecting Microsoft's favored new client platform outright, but rather are taking a gradual, almost case-by-case approach to migration.

At Allen Bradley, for example, Windows 95 is the official "platform of choice," according to Carol Schlintz, PC LAN administrator for the manufacturer. However, "We're not doing an outright conversion, like everyone has to be there by next fiscal year."

Schlintz speaks for many when she cites high upgrade costs as the main reason for a slow migration. "Many machines need upgrades to run Win95. Out of 35 machines, six went belly-up" during the conversion process, she explains.

Utah Tax Commission is also installing Windows 95 on an "as-needed basis," according to Dallas DeFrancesco, LAN administrator for the Salt Lake City-based agency. The agency has put off a "broadbased migration" to Windows 95 primarily because some current applications, such as a statewide financial package, don't run on it yet.

DeZurik Corp., a 95% Windows 3.1 shop, "will probably move to Windows NT in the next year or two, because I think we'll see more application sets written to run on NT," says network administrator Daniel Grube.

What soured the Sartell, Minn., manufacturer on Windows 95 was a recent Gartner Group, Inc. study that put the cost of upgrading the average 3.X workstation "on an order of $1,700, including hardware upgrades and training," Grube says. "Times 400 PCs, that's real money."

—Elisabeth Horwitt

WIN95 CAN BE A BUDGET BUSTER

First, there are software-related costs...

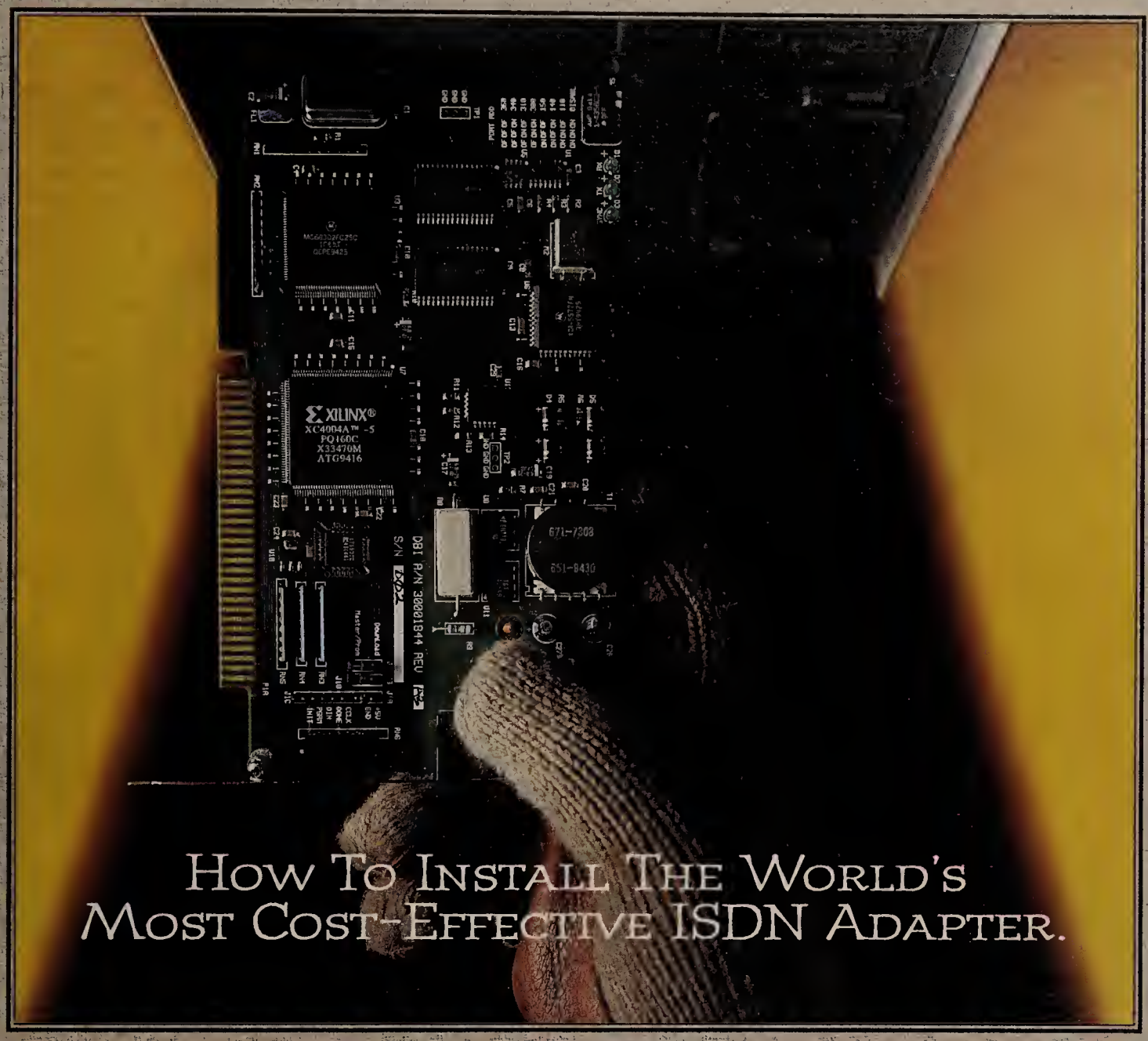
		OS migration	Applications migration	Total
Cost per end user	Best case	$358	$1,005	$1,363
	Worst case	$932	$2,350	$3,282

...then there are hardware migration costs to consider

		New Win95-ready PC	In-place upgrade	* Relocation	* Retirement
Cost per end user	Best case	$101	$92	$329	$211
	Worst case	$284	$234	$1,023	$820

*Refers to relocating and retiring PCs or parts of PCs displaced by new purchases.

SOURCE: GARTNER GROUP, STAMFORD, CONN.



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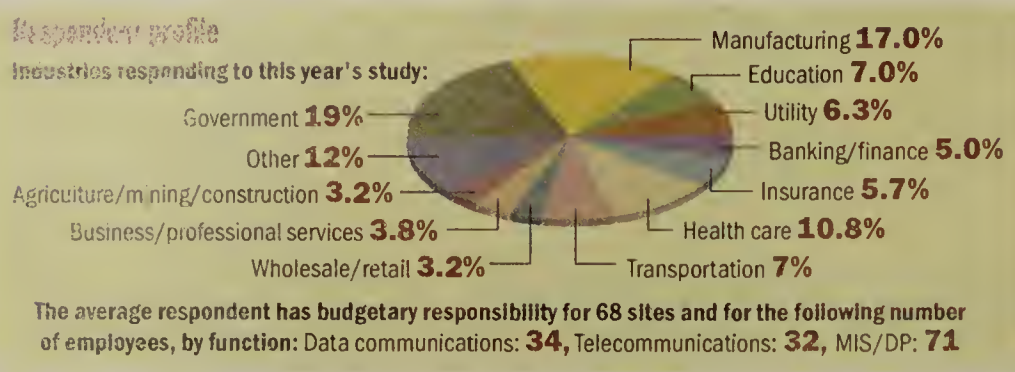
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costs, scheduling, inventory, shipping and receiving, Nickerson says. The end result, Luhr & Jenson hopes, will be a $500,000 reduction in the plant operations budget.

The company is also allocating a large chunk of its budget to "stepping up to the Internet, like every large-volume manufacturer," for advertising and potentially for EDI, Nickerson says.

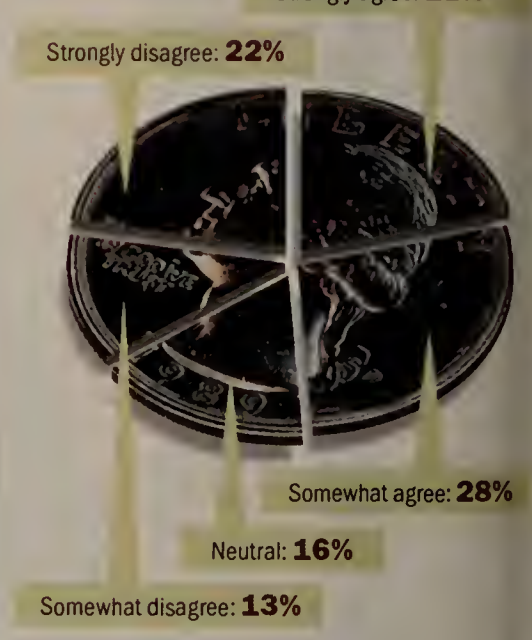
Sign of the times

Of course, tight budgets, corporate downsizing, and flat or deflating markets also play their part in decreased budget allocations, the survey finds.

Indeed, 29% of respondents say they had to hold back on major expenditures "quite often" during the past year, and 55% said they had to do so occasionally. For 1997, 23% expect to hold back often, and 66%, occasionally.

OUTSOURCERS AND BUDGET PRESSURE

Respondents were asked to what degree they agree with the statement, "There is evidence in my company that the networking department has to compete for business with outsourcers."



Consider the Utah Tax Commission. "[We] just went through a tight budget crunch and are spending less this year than we ever have," says Dallas DeFrancesco, LAN administrator for the Salt Lake City-based agency. "We bought 30 laptops this year, the least [number of workstations] we've ever bought in a year." The reason is less industrywide than specific: A five-year project to rewrite tax systems is taking precedence over IT for a while.

Even when the financial picture is comparatively rosy, respondents report that upper management is pressuring IT operations to stay lean and mean.

At Allen-Bradley Co., for instance, IT budgets went down 3% last year, and will go down another 3% next year, according to Carol Schlintz, PC LAN administrator for the manufacturer. "Productivity and efficiency are buzzwords used to sell [IT projects] around here. In general, you have to do more with less, and my sense is this is widespread in the industry, even if there isn't an economic reason you can point to."

"The days of 10%, 15%, 18% IT budget growth are gone. Now it's more like 3% to 5% increases," agrees DeZurik's Grube. As a result, he says, "We do a lot



For the royal treatment in London, Cargill went to Switzerland.

When one of the largest private companies opened its European headquarters in London, it went out of its way to choose Swiss Telecom as its communications hub. "Swiss Telecom has been working with us for more than a decade," says Peter Brown, vice-president for telecommunications at Cargill. "We knew they would keep our hub costs low, their technology would be state-of-the-art, and they would solve our communications problems — often before problems would arise. Plus, the service is seamless. When I have a question, I know exactly where to call. It made perfect sense," Brown says.

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SWISS TELECOM PTT

Networks that run like clockwork.

more work with fewer people now." The past few years have seen IT staff levels drop from 16 to 12, Grube says. During the same period, the number of PC users went from 150 to 400.

One indicator of a general IT budget crunch is the percentage of IT expenses charged back to individual departments, which 51% of survey respondents say has increased over the past two years.

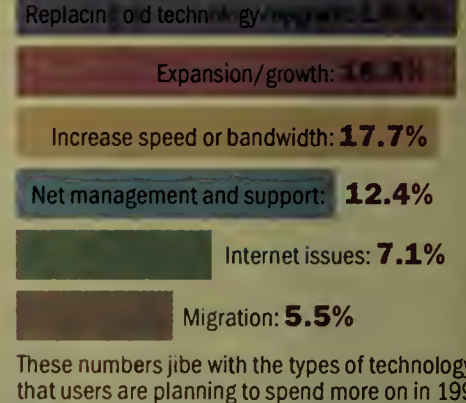
While charging networking expenses directly to end users can help IT keep its own budget within bounds, it's no easy job coming up with allocation formulas that everyone agrees are fair — particularly for hard-to-measure expenses like a corporate network infrastructure, The Yankee Group's Mann points out.

"Tools are not available yet," he says, particularly for accurately measuring how much of the network infrastructure a given application is using.

With business units assuming a growing proportion of IT infrastructure overhead, business managers are increasingly taking an active role in the IT budget allocation process, a recent Yankee Group survey finds. The survey, which is not yet completed, queried clients on the extent to which the IT and business sides were involved in "steering the [networked computing] infrastructure," Mann says. Yankee Group clients report setting up formal bodies such as steering committees in which IT managers and business unit managers jointly determine infrastructure allocations, based on the needs of that unit.

BEHIND THE NUMBERS

Respondents were asked why they were planning to increase spending significantly next year in a given area. The most frequent responses were:



These numbers jibe with the types of technology that users are planning to spend more on in 1997, with net management and LAN/WAN infrastructure topping the list, while items such as client/server migration fall at the bottom.

Some clients have a clean split. "Business units decide entirely what applications they want, while IT does infrastructure," Mann says. "That requires trust" in IT on the part of business management.

Another challenge facing IT budget architects is that rapidly changing technologies make it hard to draw an accurate bead on future networking costs. According to Mann, one Yankee Group survey question asks, "Is IT going to get its arm around the technology it will have to learn in the next five years?" A common response: "It will be real difficult."

Network World budget survey participants would vouch for that.

"My budget is sometimes a dart in the wall," says Berlin Foundry's Roggenbauer. "As we put it together for the next fiscal year, we can predict what computers will cost pretty well. But with hubs and routers, actual costs sometimes double [budget estimates]. Sometimes, a brand new technology comes along and I'm not even close. The same things show up [on successive budgets] because we don't get to them, or the price or technology changes.

"I just keep a running list of what needs doing, start putting in dollar amounts, and when I hit the magic allocation number, I stop."

Horwitt is a freelance writer based in Waban, Mass. She can be reached via CompuServe at 75244,1666.

NetworkWorld UNPLUGGED

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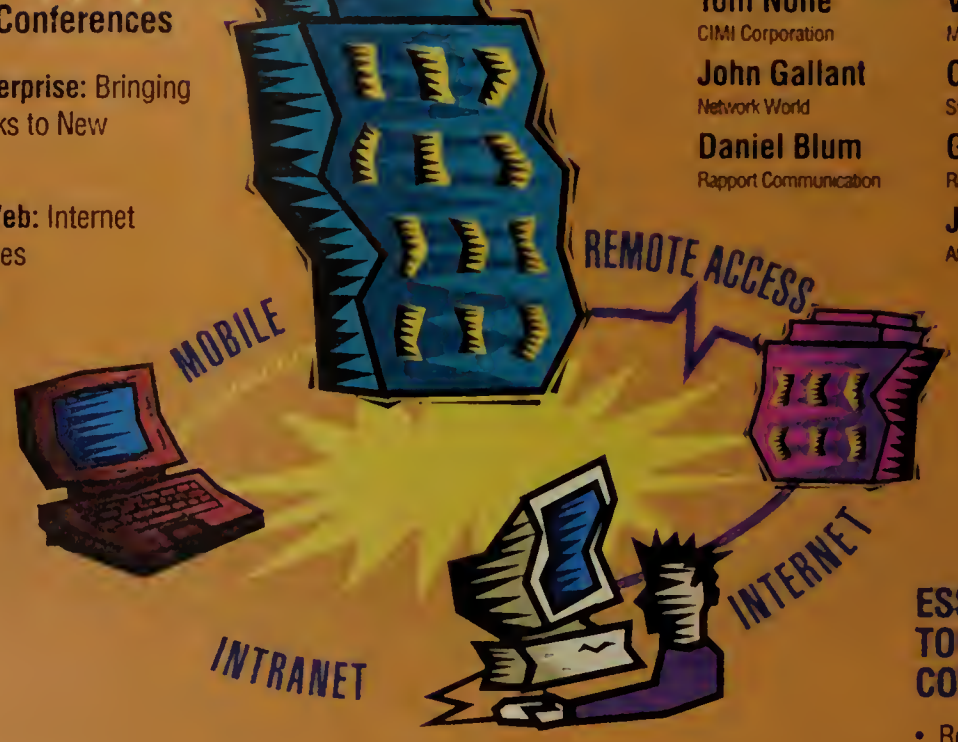
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Warp Server surges forward

Integrated management and administration tools help make OS/2 Warp Server a winner

By Esther Schindler

IBM's LAN Server has always had a good reputation in IBM shops. In its latest release, OS/2 Warp Server, this network operating system may win a few converts from outside the faith.

IBM has bundled an array of tools that network managers will find indispensable. In addition to file and print services, OS/2 Warp Server includes backup tools, advanced print functions, application sharing, remote connection services, hardware and software inventory and performance monitoring.

The strongest of the new components is SystemView. Its capabilities include software inventory and license management, automated software distribution and critical file monitoring. SystemView dynamically updates all information about individual computers or groups of workstations. You can examine hardware and software configurations over the network or over a telephone line.

Monitoring tools let you access workstations in real time to keep track of a wealth of attributes, from disk space to CPU utilization to the number of threads in use (see graphic, this page).

You can set alerts and be notified via electronic mail or pager. There is much more, including a RAID manager, process status viewer and event scheduler — with depth as well as breadth. You can discover a remarkable amount of information about a workstation without leaving your desk.

SystemView really impressed us. Initially, we wondered if SystemView's capabilities would be superfluous in a small office, where walking to an errant workstation is easy. However, the ability to see what a workstation is up to — even if the server and workstation are side by side — is slicker than a smelt. SystemView alone justifies the purchase of Warp Server. SystemView's remote diagnostic tools let you focus on improving your network, not coping with emergencies that are at the other end of the corporate campus.

We did manage to bring SystemView to its knees during testing. On one workstation running a monitoring program that we accessed with SystemView, we had Neon (an OS/2 three-dimensional animation program) render an animation, and it consumed more CPU cycles than SystemView's monitor could cope with. When the SystemView server lost contact with the workstation, it hung the server.

A tuning assistant guides you through tweaking server performance. You fill in system values, such as the number of users and the software on the server. The tuning assistant makes recommendations based on the numbers you provide. In our case, it suggested that we add RAM to our 16M-byte server.

This recommendation was right on the money since we ran SystemView on the file and print server. Realistically, both LAN Distance, IBM's remote access application, and SystemView should run on dedicated servers, especially if you use the license or code distribution features.

Despite our overloading of the server, performance was never a problem.

IBM has added some enhancements to Warp Server's core services. Direct support is provided for OS/2, DOS, Windows for Workgroups, Windows 95 and Windows NT clients. Macintosh client support costs extra. TCP/IP support operates faster and is more robust, especially in DOS sessions.

Dynamic Host Configuration Protocol (DHCP) and Dynamic Domain Naming System (DDNS) eliminate a common headache in TCP/IP; Warp Server provides dynamic assignment of IP addresses, on demand. If you move a workstation, it is automatically configured for network access wherever it plugs into the IP network, and the

NetResults

Product	**OS/2 Warp Server**
Vendor	IBM (800) 426-3333
Price as tested	For 100 users: OS/2 Warp Server $629 OS/2 Warp Server Advanced $1,299 Additional licenses $49 each
Pros	▲ Excellent SystemView management tools included ▲ Includes DHCP server ▲ Robust, reliable performance ▲ LAN Distance remote dial-in tools included
Cons	▼ Installation process fraught with pitfalls ▼ Macintosh client an extra-cost item

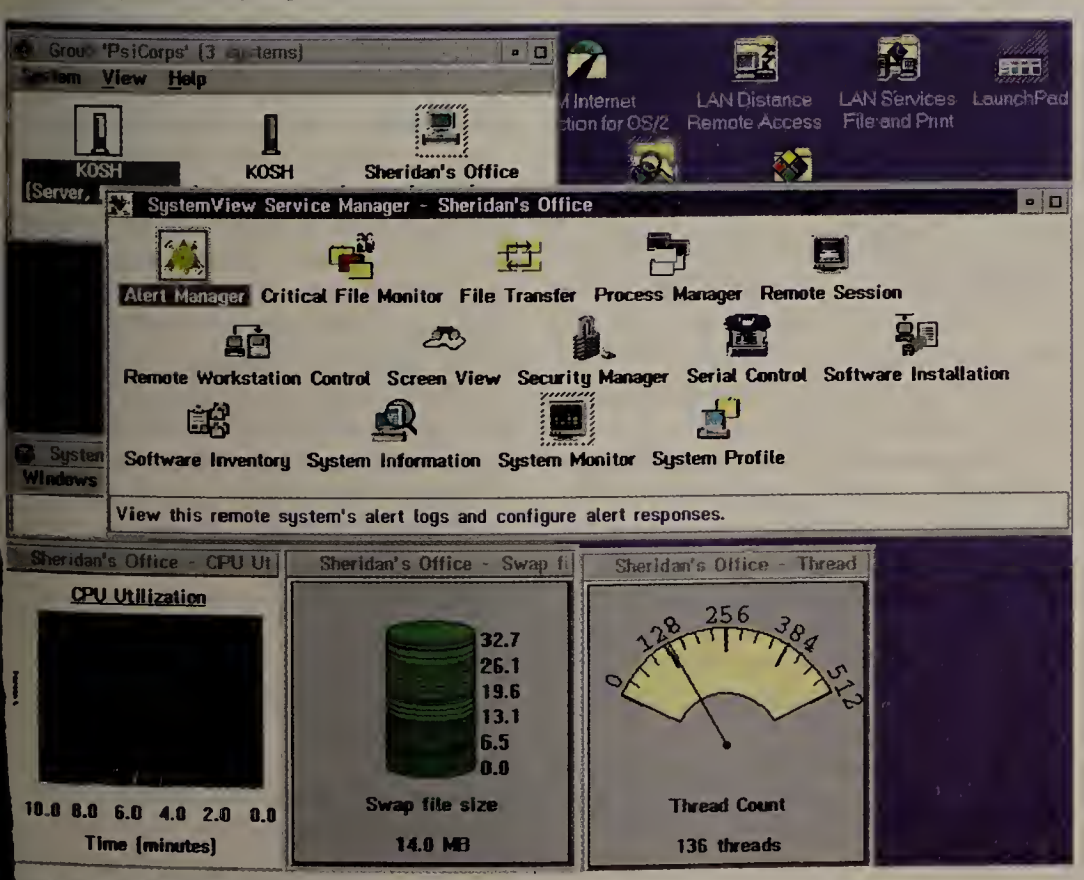
SCORECARD

OS/2 Warp Server	
Overall score	**9.0**
Naming and directory services (15%)	8
Management/administration (20%)	10
Performance (10%)	8
Networking/connectivity options (10%)	9
Security (10%)	8
Scalability (10%)	9
Stability (10%)	10
Flexibility and ease of use (10%)	10
Installation and documentation (5%)	7

Scores based on a scale of 1–10. Categories are weighted by the percentages shown.

Network World WORLD CLASS

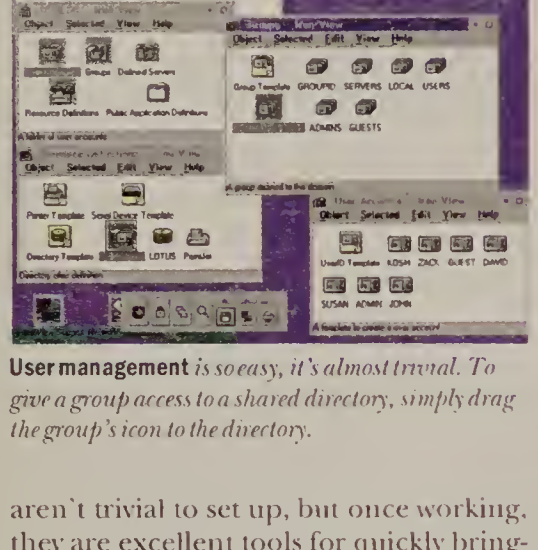
OS/2 Warp Server is the first recipient of our new World Class award, given to products that achieve a rating of 9 or above on our product scorecard.



SystemView's graphical monitors *let you peer inside the hood of any workstation on the network to find out what it's really up to.*

machine can be located and accessed using its permanent, unique Domain Name Service host name. As a result, a novice user should be able to take a laptop computer to a field office and plug in to the network without administrator intervention. DHCP supports true IP systems, not just NETBIOS over IP.

Software distribution services allow you to establish processes to distribute and install operating systems and applications over the network. These services



User management *is so easy, it's almost trivial. To give a group access to a shared directory, simply drag the group's icon to the directory.*

aren't trivial to set up, but once working, they are excellent tools for quickly bringing large numbers of systems online. Warp Server includes NetWare gateway services, as well as facilities to connect to Windows NT Server, Unix or VM-based mainframes. The NetWare Services Gateway allows for easy integration of Warp Server and existing NetWare servers. Clients can share files and printers across both systems directly from Warp Server.

For the most part, the file and print services in Warp Server are the same as in previous versions of LAN Server. For example, Warp Server's basic philosophy is based on groups of servers called domains. When users log in to a domain, they have access to multiple resources on the servers therein, depending upon access privileges set by LAN administrators. Peer services let users share directories and peripherals with a few mouse clicks. Public and private applications may be made available to users.

The domain naming scheme has individual domains that can be connected, but lacks a hierarchy of domains as provided by a true directory service such as Novell, Inc.'s Novell Directory Services (NDS) or Banyan Systems, Inc.'s StreetTalk.

The use of aliases — system nicknames that describe a particular directory or resource — permits you to change the location of data (i.e., move a directory) without affecting how users access the data. If you move the Accounting directory to another server, for instance, people who use the "Acct" alias assigned to that directory won't need to know that anything changed — Warp Server manages this transparently. Like the earlier LAN Server, Warp Server maintains the difference between Entry and Advanced versions. The more expensive version adds more efficient disk access (High Performance File System 386), disk-mirroring and tools to control users' disk usage.

You create and manage users, groups and resources by dragging and dropping icons. For example, you drag and drop a directory resource onto a group of users to give that group access to the directory (see graphic, this page). It's so easy that a novice administrator might wonder why network management has earned such a miserable reputation.

Among Warp Server's new tools is the Personally Safe n' Sound backup application. PSnS includes all the basics of system backup, including the ability to back up workstations, with a pleasing interface. PSnS has IBM's Adstar Distributed Storage Management support, multimedia capabilities and other useful features. PSnS won't let you back up the server from a workstation, though if the network volume warrants it, a separate server can be used as a backup server.

When you dial in to the network using Warp Server's remote connection service, LAN Distance, the remote system appears to be physically connected, just as if you were logged in at a typical workstation.

Warp Server's documentation quality varies from adequate to excellent. Some sections of the printed manual are well written, including examples that make it easy for beginners to understand what to do and why. Other instructions would make sense only if you already understood the subject. Online documentation is quite good, but serious network administrators will want to acquire IBM's Red Book technical guides that delve into OS/2 and Warp Server facets in excruciating detail.

Rough installation

Despite features that make managing a network easier, Warp Server's installation process is prone to problems. When it works, it works well. However, at times it seems the installation process attempts to hide complexity instead of minimizing it, and simply winds up making things more difficult.

For example, installation of a new server leads you through notebook pages on which you provide relevant data about your server. Check marks indicate which sections are preconfigured and which items require more information. Because of the number of steps involved (should any process with 33 separate steps be labeled "Easy Start"?), it's tempting to bypass check-marked sections. After all, why should you look if the work is done?

However, one of the items checked off is the default domain name and password, which means you could get through the entire Warp Server installation and be stymied by the initial request for login ID and password. The installation program never makes a point of telling you what they are.

Installing over an existing LAN Server setup isn't necessarily an improvement. One of our testers is a knowledgeable OS/2 user who uses LAN Server to run his small business. He tried to upgrade to Warp Server, and after countless error messages, he decided to reformat the drive and start from scratch. That worked. While this is tolerable on a five-station network, it would be unacceptable in a larger environment. This bodes ill for less educated OS/2 administrators.

Installing the client software on a Windows 95 workstation worked right the first time, so we expected the client to load trouble-free on an existing OS/2 Warp (not Warp Connect) workstation. We were wrong.

First of all, the installation program wouldn't work with Object REXX, a new object-oriented version of IBM's powerful OS-aware programming language. (Presumably, if you know enough to install Object REXX, you should be able to remove it when encountering conflicts. But Object REXX is IBM's product!) Then the installation failed because the network adapter was configured incorrectly. Yet, despite its inability to communicate with the adapter, the installation kept going.

Once that was fixed, we got all the way through the installation until we were informed that there wasn't enough room on the hard disk for MPTN. The installation program did not define MPTN, so how would a novice know if it's important? (It stands for Multiprotocol Transport Networking.) Nor did it offer an opportunity to retry after we switched to a command window and made more room on the partition. We had to work through the whole installation program one more time.

ON LINE

Link up with online OS/2 resources via Network World Fusion.

Select NetRef, Buyer's Guides and Reviews, then OS/2 Warp Server.

http://www.nwfusion.com

Installation is not a rewarding experience when you want to add equipment or support after the fact. In one case, the backup software refused to see a tape drive that we later added.

The straightforward interface of OS/2 Warp's Selective Install doesn't exist for the client requestor. To add the SystemView client later on, we had to pick out that module from the installation program. IBM points out that most OS/2 users will depend on OS/2 Warp Connect for requestor installation (which is indeed much better), and promises smoother integration of network features in the next version of the OS/2 client, code-named Merlin.

Perhaps we give too much emphasis to installation, but IBM says it is marketing Warp Server to small businesses as well as large enterprises. In an environment without a dedicated LAN administrator, and especially in situations without knowledgeable OS/2 users, Warp Server may be tough to get working right.

What's missing in Warp Server? Directory Security Service (DSS) won't arrive until later this year. DSS will work with other Distributed Computing Environment-compliant applications and systems on a variety of platforms, including personal computers, workstations, minicomputers and mainframes. IBM says DSS will provide an enterprisewide named space and security model, much like NDS does but more open.

Support isn't cheap. If IBM is really addressing the small business market, it may find some resistance to support calls that cost $190 per incident. Yearly contracts are also available, with unlimited calls, but they're expensive, too.

A hard-shelled host

Warp Server may sometimes seem as graceful as a turtle, but it's also as indestructible. While we did manage to kill the server as stated earlier, we found that when the server came back up, all the workstations reconnected automatically without missing a beat.

Warp Server's robustness is impressive. While our Warp Server installation is relatively new, our own installation of its predecessor, LAN Server 4.0, has been running, with zero failures, for two years. The only time the server required a shutdown was to move facilities.

OS/2's strengths — consistency, stability and flexibility — are readily apparent. If you're comfortable using OS/2, OS/2 Warp Server will be instantly familiar. If you're not yet familiar with OS/2 or have experience with another network operating system (NOS), you might start out with the same awkward feeling of reaching for the stick shift in a rental car in a strange city at midnight. If you choose to evaluate OS/2 Warp Server, take the time to learn OS/2 on the workstation first.

For existing LAN Server shops upgrading to Warp Server is a no-brainer. If you're using another NOS, however, Warp Server may still be an excellent option. On cost alone, a competitive upgrade to Warp Server can be cheaper than a NetWare upgrade. Warp Server's tools for day-to-day management are so good that you'll spend less time in crisis mode and have more time available to enhance your network.

When Warp Server is good, it's very, very good. IBM delivers on its promises to make daily network management easy, and SystemView could make the entire NOS worth the price. But you need to prepare yourself for what might be a rocky installation process.

Schindler is senior contributing editor for OS/2 Magazine and an OS/2 corporate trainer. She is sysop on several online forums and program chair for the Phoenix OS/2 Society. You can reach her at esther@primenet.com.

HOW WE DID IT

We tested Warp Server on an IBM Server 320 with a 90-MHz Pentium CPU and 16M bytes of RAM. Our tests focused on usability and manageability rather than performance.

In addition to setting up and maintaining user accounts, we investigated the management features and monitoring tools that IBM touts among Warp Server's strengths.

Following FPL's ATM project

ontinued from page 1

"This is a painful process," Pina says. You have got to understand the technology, but more important, you need to grasp your business motives for using it."

usiness case

FPL's objective is to build a nine-node TM backbone ring on top of the SONET et, which snakes north from Miami ong both Florida coasts (see graphic). n addition to introducing switching technology to the fiber backbone, the ATM et will enable the utility to consolidate oice and data over the same circuits, ereby reducing the number of T-1 tienes needed to connect spur sites to the ONET backbone. That alone will save ie company an estimated $125,000 nually, says John Paul, manager of teleommunications architecture.

IT JUST MAKES CENTS

On its current SONET network, Florida Power & Light's interstate and intrastate calls average 5.2 cents per minute. That's about half the cost prior to the SONET net.

ATM will also help to extend essential networking services to sites where the SONET ring doesn't reach. For example, the ATM net will be used to carry Supervisory Control and Data Acquisition and power station telemetry data – the type of information that lets engieers monitor power demand and deliver xtra capacity to hot spots. Such data is ritical to FPL's Power Delivery business nit, which operates out of the company's eJeune-Flagler office, a spur site in liami. Like dozens of other sites, it is far emoved from the SONET ring.

"It would cost millions to build a fiber onnection to get them to link into our ONET backbone," says Neil Flynn, irector of the Telecommunications & echnology unit. "ATM can do it by leasng carrier capacity, and at a lot less cost an all the backup T-1s we're leasing oday."

In addition, ATM will likely help reamline the company's voice communications. Today, three tandem switching enters handle all on-net voice calls. An TM infrastructure could enable the ompany to distribute the tandem switchng function further out into the SONET etwork, reducing the need to pull traffic om distant points such as Daytona and ring it to West Palm Beach, the nearest andem switch site.

oundation time

But before any such ATM benefits can e realized, FPL has to complete its ONET net rollout. "We'll lay the foundaon with the fiber, and then build on top f that with the [ATM] switching," Flynn ays.

FPL's 767-mile SONET network has been in existence for nearly seven years, but the fiber net stops short of full SONET ring capability: It travels as far north as Sarasota on the west coast and Daytona on the east coast, but there is no connection in between.

Just two months ago, company officials resigned themselves to leasing expensive T-3 capacity to bridge the gap and provide the necessary infrastructure for ATM.

But in the last few weeks, FPL has been approached by several companies — including an as-yet-unrevealed major carrier — offering to finish the SONET ring. Those discussions have pushed back the ATM project a bit; FPL had targeted mid-September as its installation date for ATM switches. Now, Flynn says, the implementation will occur by year-end.

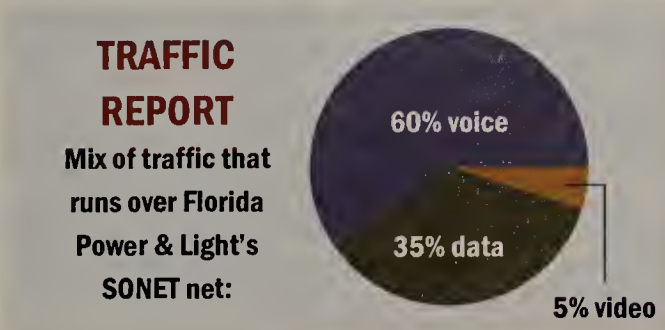
The short-term delay should give Pina a bit more time to mull over plans for meeting several major milestones. During the summer, FPL's Telecommunications crew will be busy conducting site analysis for switch implementations.

Pina will also be carefully choreographing the steps for the switch installation this fall, and determining an installation date. Once the switches are in, FPL will monitor limited traffic for one month, before a complete cutover takes place by the end of the year.

Of course, all that activity hinges upon the ATM switches showing up. Pina is quick to smile and decline to name a switch vendor just yet — even though he knows which ones are at the top of his shortlist.

The RFP process

The company recently finished an exhaustive ATM switch analysis. Its request for proposal included more than 450 questions, filling 23 pages. It took about 45 days for Pina to assemble all the input from the five contributing staffers.



"We didn't want to pick a product and be in a position to have to forklift it later," Pina says.

In the end, eight vendors responded to the challenge: DSC Communications Corp., GTE Government Systems Corp., IBM, Newbridge Networks, Inc., Northern Telecom, Inc., StrataCom, Inc., NET/Adaptive and UB Networks, Inc.

The RFP instructed them to detail their ATM switch products as outlined, or risk being dropped from consideration.

Up front, a section on absolute requirements poses 16 conditions, including the following statement: "The prospective vendor must take full and unconditional responsibility for satisfactory operation and performance of all system components upon turning the system over to the customer."

Section 2 of the RFP maps out FPL's ATM objectives. It includes four diagrams that depict the initial ATM network topology and show how the switches will be used for future applications. A section on the product's switching hardware asks detailed questions about architecture, capacity, scalability, fault recovery and automatic reroute functions, as well as inquiring about available voice, data and video modules.

The software section examines network management issues, routing and connection management, switched virtual circuits and congestion control, among other topics. FPL included a separate section on LAN emulation.

Once the responses came in, Pina spent countless hours comparing functions and features in spreadsheet format, and calling vendors to fill in the missing pieces.

"I had a good idea who was going to emerge from the pack; this was just sort of a validation exercise," Pina says. But the RFP was still necessary, even though he spent close to two years studying the market and quizzing vendors. "The formal RFP process really makes vendors open up," he says.

When he narrowed down his shortlist, Pina says he visited his top prospect to "kick the tires and take a closer look at the products in action."

Voice rules

What disturbs Pina about many of the vendors is how little attention they pay to voice traffic. Many ATM switch makers have spent a fair amount of time developing data standards, but lack similar functions for call forwarding and other voice services.

"The same way they've addressed routing protocols for the data side, they should address protocols for voice," Pina says.

In his estimation, two ATM switch providers are doing just that. Nortel and StrataCom emerged as viable candidates due to proprietary steps they've taken to read common channel signaling data and establish calls based on what's inside those messages.

"We're not happy about the prospect of going back to a proprietary way of doing things," Pina says. "But they're taking a step forward by at least addressing some of these issues."

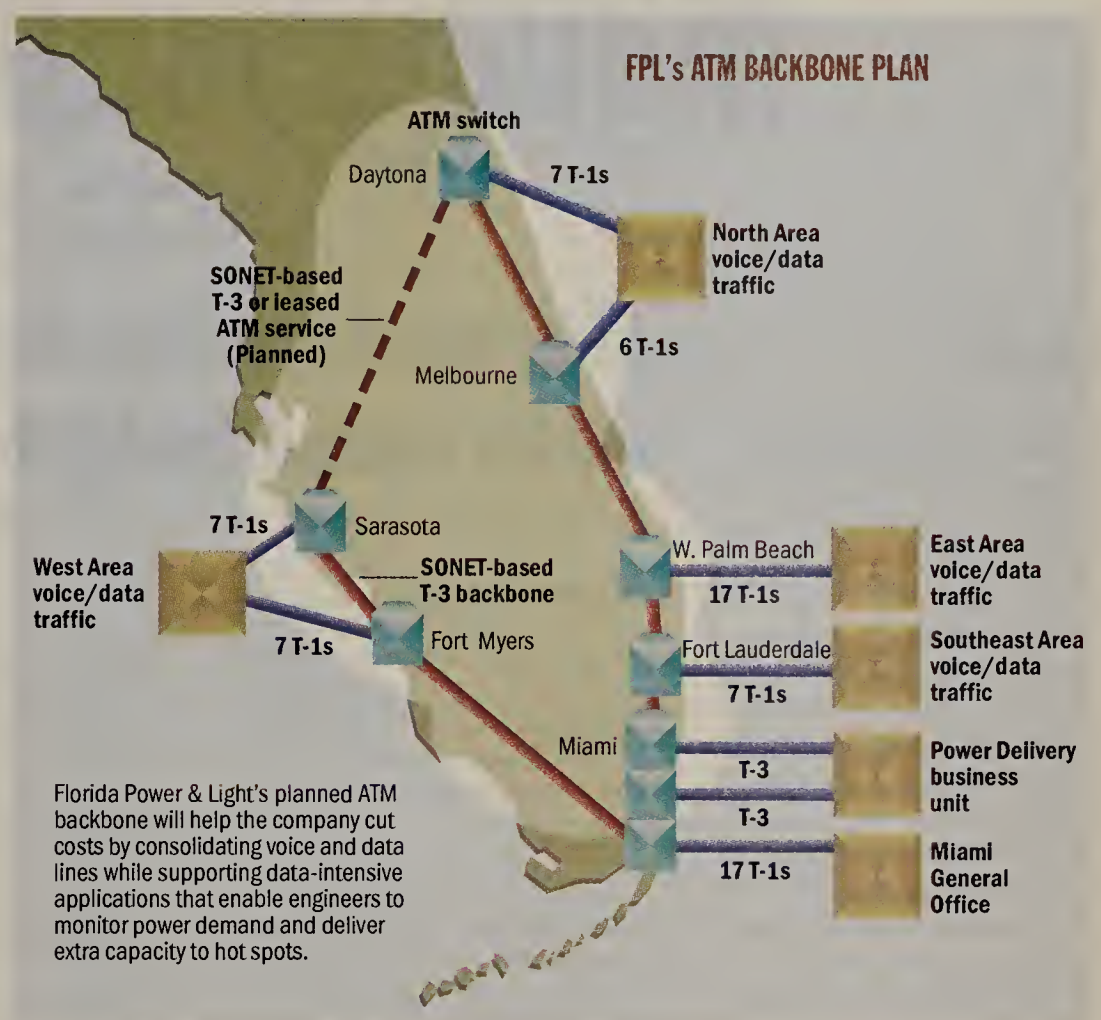
The next step

Fairly soon, FPL will announce its switch supplier. When it does, *Network World* will be there to tell you how and why that vendor's product stood out from the others.

In the meantime, Pina has an enormous task ahead of him. Already, he is busy developing a timetable to stage the various events that will occur on the road to ATM implementation.

Even seemingly simple things, such as tweaking remote site floor plans to make room for the incoming ATM switches, is a task he sees as requiring careful planning. Sweating the details and working long weekends from now through implementation isn't a bright prospect. But it's one Pina recognizes is important to the project's success.

As he puts it, "You've got to do your homework and really understand all of your company's needs and requirements before you fall victim to the hype of ATM." ■



Management Strategies

Covering: Career Insights and Innovations in Managing Staff, Budgets and Technology

Briefs

Martin Information Services, Inc. *is rolling out training programs for Keyfile Corp.'s document management and workflow software. The firm issued a sample CD-ROM training course and announced plans to produce Keyfile Fundamentals, a* **computer-based training (CBT)** *series, later this year. The CBT courses can run on a stand-alone PC under Windows or on a network. Multimedia and text versions are available, and the per-user cost is $295.*

Martin Information Services: (919) 790-7106.

ReCor Corp. *has added* **NBT for Notes Mail** *to its Network-Based Training series of computer-based training products.*

With the program, users of Lotus Development Corp.'s Notes and cc:Mail users migrating to Notes 4.0 can be trained in the use of databases, documents and attachments using the new Notes Release 4 interface, along with the basics of reading, creating and sending mail. A network server license for 10 concurrent users costs $695.

ReCor: (847) 467-2059.

Deloitte & Touche Consulting Group *is publishing a monthly CD-ROM that will enable you to analyze data obtained from a wealth of networking industry newspapers and newsletters.*

Developed in conjunction with North Atlantic Research, Inc., the Deloitte & Touche convergence.d&t will include a search engine that enables users to sift through more than **two dozen trade publications** *covering telecommunications, the Internet, new media, computing, and cable and broadcast TV. The CD-ROM will also include information about companies in those industries culled from such sources as Newsbytes News Network and Hoover's Company Profiles. The subscribtion fee is $2,495 for 12 months or $4,495 for 24 months.*

Deloitte & Touche: (888) 333-3824.

Managed remote access services may make sound budget sense for your firm

Crunching all the numbers shows true cost of providing access on your own.

By Lenny Liebmann

One of the biggest budget busters around is providing remote access for an ever-increasing army of mobile salespeople, traveling executives, full- and part-time telecommuters, customers and suppliers.

Any network manager responsible for making remote access possible will tell you the same thing once they add up what it costs for equipment, telephone charges, support and administration. And it seems to never end because remote access does not offer much economy of scale — the more users you add, the more ports you need.

To learn more about remote access issues, jump to Network World Fusion. Select Careers then Remote Access.

NetworkWorld Fusion
http://www.nwfusion.com

There is a way to drive costs down, though. You could turn the remote access chore over to a remote access service provider.

These firms, which include the top long-distance carriers as well as online giants CompuServe, Inc. and America Online, Inc., offer a different cost model, one that could make remote access expenditures more predictable.

The service providers charge an hourly rate that's significantly less than the rate for regular dial-up calls. They also relieve customers of the need to lay out capital for communications servers and modem racks. Plus, they eliminate the staffing requirements for administration and maintenance of communications equipment.

"The question is whether you want to put capital equipment on the books, maintain that capital equipment in terms of setting up access rights and logins, and then continually have to buy more in order to balance users and ports," says David Goodtree, senior analyst at Forrester Research, Inc., a Cambridge, Mass., consulting firm.

"Instead, the carrier can take on the whole problem and engineer your traffic along with everybody else's," he says.

Computing the costs

A broad range of variables affect remote computing costs, so it's difficult to make precise statements about how much you'll need to spend to support remote users with an in-house communications server. Connection costs, which are the largest cost component, can vary greatly depending on the number of access hours needed per day, the distance from which users dial in and the rate the carrier is charging.

The number of access hours each user racks up also affects the ratio of users to ports. When the hours-per-user figure increases, more ports are required, which increases the capital expenditure.

But you can plug in some numbers for a sample scenario to get a feel for the costs. Doing so quickly illustrates the case for considering a managed service to contain costs.

For example, a company with 150 mobile salespeople whose access requirements are comparatively high — say about 10 hours a week — could log 6,000 hours of calls each month to a dial-in 800 number. That volume would produce about $48,000 in monthly phone charges, based on the prevailing per-minute rate for 800 services.

In order to make sure those users didn't encounter busy signals when trying to dial in, the company might install as many as 25 modem ports, or about $40,000 worth of hardware. Assuming a three-year lifespan, that adds another $1,000 per month to the picture.

With administration and first-level support staffing calculated in as well, this company's total monthly budget for remote access can easily exceed $50,000.

Managed service providers, on the other hand, will charge you $2.50 to $3.50 per hour of access, which would bring the monthly dial-in bill for the company in our example to under $20,000.

That figure would include call charges, premises equipment leasing and a dedicated link between the company and the provider's network (see graphic). That's a savings of more than 60%.

It's their business

Carriers can offer these prices by leveraging what's already installed in their networks. With the managed dial-in services, remote users dial in to one of the service provider's points of presence, rather than directly to a modem pool at the corporate site.

The service provider carries that traffic over its own network infrastructure, delivering it to the corporate site over a single line.

The cost comparison

Here's what it would cost per month to provide remote access services for 150 users racking up 6,000 hours of connect time:

In-house
Connection charges: **$48,000**
Amortized equipment costs: **$1,100**
Support and administration: **$1,600**
Total: $50,700

Managed service
Connection charges: **$18,000**
Equipment lease: **$500**
Dedicated link for traffic aggregation to customer site: **$1,200**
Total: $19,700

Thus, all active dial-in sessions are aggregated by the carrier onto one router port rather than numerous asynchronous or ISDN communications ports.

In many cases, the service provider will lease you any necessary premises equipment and assume all responsibility for its configuration and maintenance.

By aggregating a huge volume of dial-in sessions over their own networks, service providers can drastically reduce their incremental cost for handling additional call loads. Companies that rely on the public switched network can't do that because they have to add lines every time the user count goes up.

The online service companies also have a large existing investment in dial-in technology, since they use it extensively to support their primary business. CompuServe, for example, has more than 100,000 modem ports worldwide.

Years of experience with those modem ports puts carriers in a good position to provide end-user support services in addition to relatively low-cost communications services.

"Being able to troubleshoot the problems that crop up in remote access takes a lot of talent and people power," notes Skip Taylor, CompuServe's manager of remote access services.

"We add a lot of value there in addition to the financia incentive," he says.

Managed services also transfer the burden of coping with rapidly changing technology to someone else's shoulders. Corporate staff no longer has to worry about how many ISDN ports to add or whether innovations such as Asymmetric Digital Subscriber Lines will render equipment prematurely obsolete.

"Our service provider provides the remote access cloud and we attach to it at the router," says Syd Limerick, director of enterprise computing at Texas Instruments, Inc. in Dallas. "S we don't have to worry about how they get it to our site.

"We've carved remote acces up into a set of requirements an handed it over to someone w think can take care of it for u It's their responsibility," Limerick says.

Turning over dial-in access t an external provider is also le politically touchy than othe forms of outsourcing becaus most departments don't have a entrenched remote communic tions staff.

So it's not as internally disru tive a decision as contracting f network management or he desk services might be.

Liebmann is a consultant a writer in Highlands, N.J., specializing in networking technologies. can be reached via the Internet ll@interserv.com or by phone (908) 872-8500.

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Technical implementation and maintenance of internal and public World Wide Web servers. Unix and HTTP server technology including firewalls, search engines, secure transaction processing, CGI scripting, and commercial Web server management software experience.

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Five years of technical writing experience with a data networking company and expertise in Framemaker. BA degree in English or Journalism or equivalent experience required.

CHANNELS MARKETING MANAGER

Develop, manage and execute marketing programs and promotions targeted at distribution channels. 5 Years of channels marketing experience in the data networking field.

TECHNICAL MARKETING MANAGER

Develop and present Xylan's technical marketing message at seminars, conferences, trade shows, sales training and other forums. 5 Years of product management/marketing and sales training experience in the networking field. Ability to travel 40% of the time.

SR. SUPPORT ENGINEER

Provide technical support. Develop solutions to user problems. 3 Years of LAN/WAN product support or similar experience.

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Territory Sales Managers (various US locations, international locations include Mexico and Brazil)

Develop territories, provide complete market coverage, as well as targeting major accounts. 3-5 Years of successful selling in the LAN/WAN market. Excellent selling and technical skills are required in the routing/bridging and switching arena, with emphasis on Ethernet, token ring, FDDI and ATM.

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Provide pre-sales support to sales reps, customers, VARs, and OEMs. Assist in technical training, seminars, writing and preparation of RFP's. 5 Years of LAN/WAN technical experience (directly with end users a plus). Must he familiar with routing/bridging and switching markets. Familiarity with Ethernet, token ring, FDDI, ATM and SNMP network management are required.

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Responsible for analysis/support of end user applications including developing custom reports. Candidates must have five years experience with Oracle RDBMS including Oracle version 7, Oracle financial, and manufacturing and distribution modules plus a BS degree or equivalent experience.

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Network Services Opportunities

The Company

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Network Consultants

Qualified individuals will possess 5+ years' experience in the network industry, understanding of distributed network technology (Network Operating Systems, Standard Topologies & Protocol Suites, Client Software, Mail Systems, Data Bases, Hubs and Switches, Routers, WAN/CPE, Premise Distribution, Logical Designs, and Network Management), demonstrated ability to balance resources while maintaining flexibility and quality as well as ability to manage customer satisfaction and resolve critical issues, and excellent communication and interpersonal skills.

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252	253	254	255	256	257	258
259	260	261	262	263	264	265
266	267	268	269	270	271	272
273	274	275	276	277	278	279
280	281	282	283	284	285	286
287	288	289	290	291	292	293
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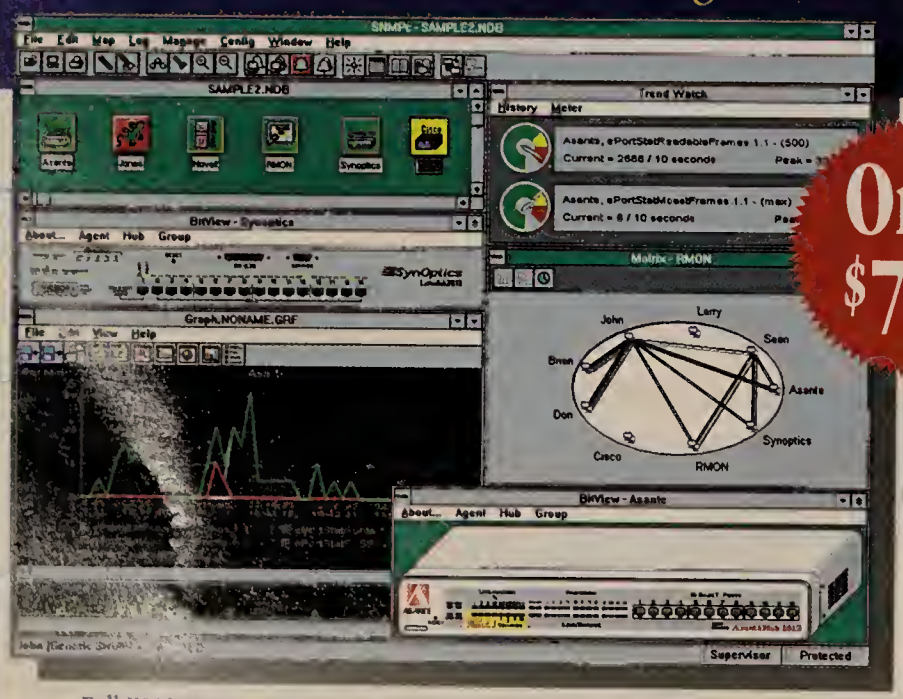
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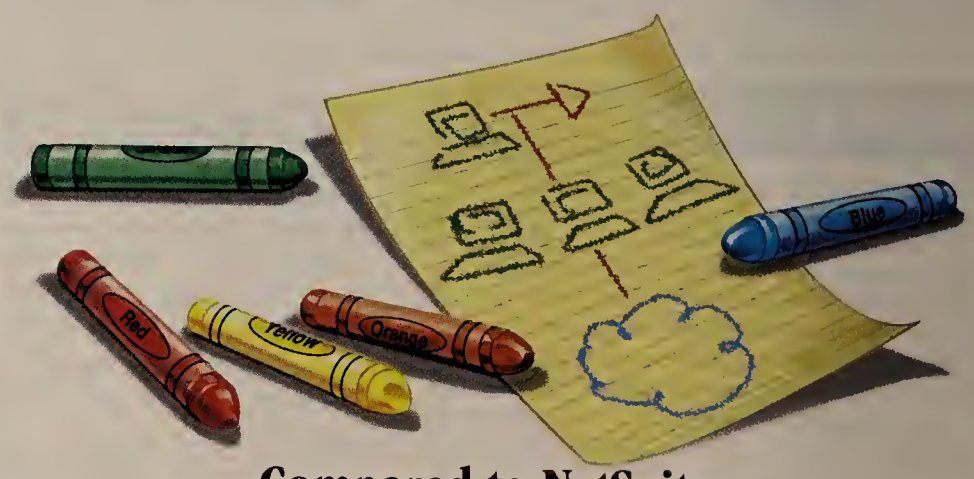
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37	38	39	40	41	42	43	44	45
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55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
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109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153
154	155	156	157	158	159	160	161	162

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163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
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271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297
298	299	300	301	302	303	304	305	306
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73	74	75	76	77	78	79	80	81
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100	101	102	103	104	105	106	107	108
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118	119	120	121	122	123	124	125	126
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154	155	156	157	158	159	160	161	162

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163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
208	209	210	211	212	213	214	215	216
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271	272	273	274	275	276	277	278	279
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289	290	291	292	293	294	295	296	297
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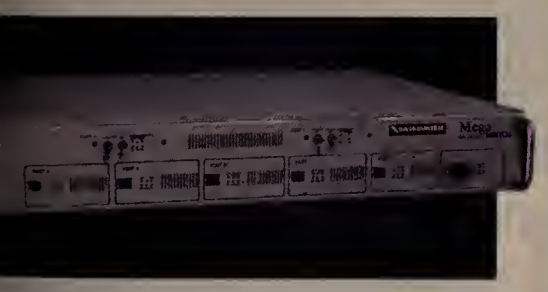
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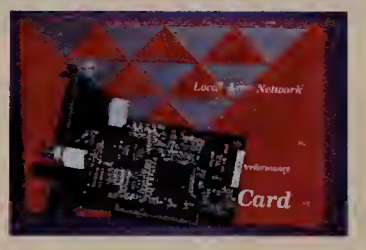
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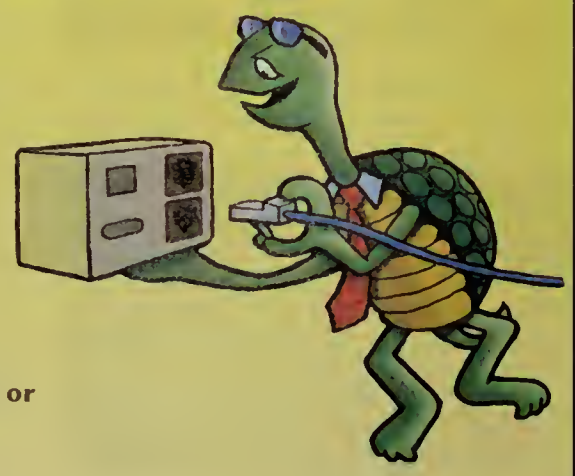
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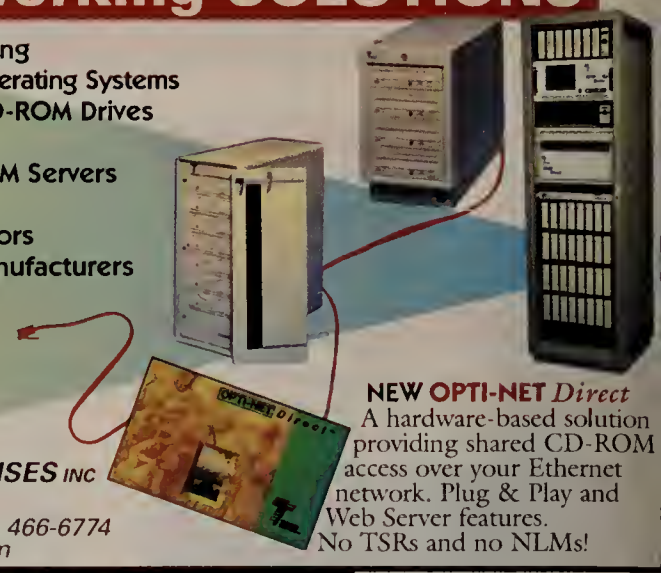
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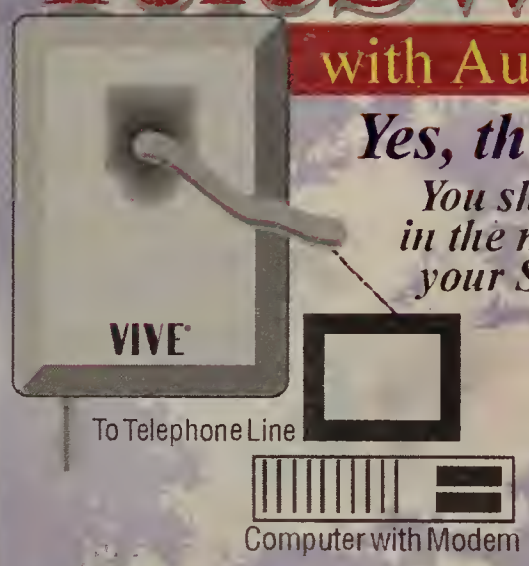
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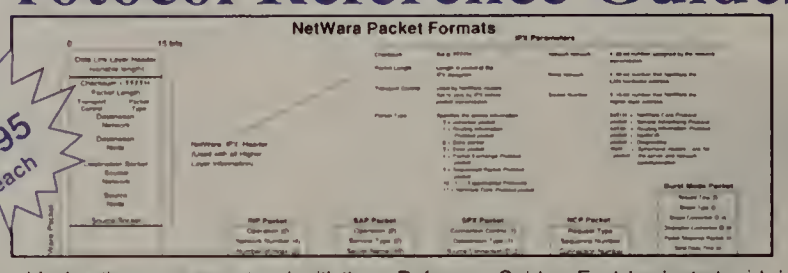
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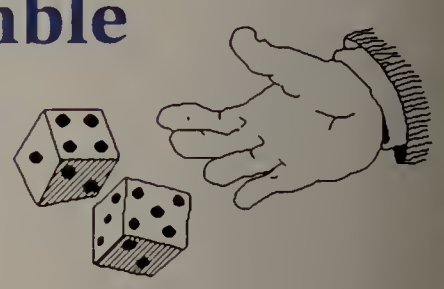
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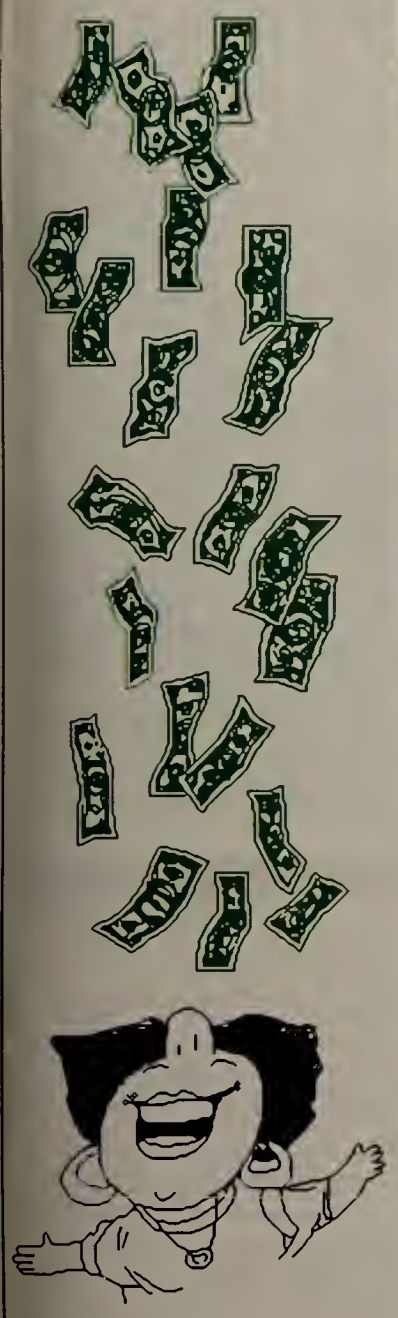
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EDITORIAL INDEX

3Com 6,30
A
Adaptec 27
ADC 27
Adtran 15
Ameritech 13
Anacapa 17
Apple 28
Ascend 17
ATMNet 25
AT&T 13,25,33
B
Bay 17
Bell Atlantic 13
Bell Atlantic NYNEX Mobile 6
C
Cabletron 27,30
Cisco 15,17,30
Codenoll 27
Cogent 27
Corel 6
CyberCash 37
D
DataMind 31
Dell 6
Deloitte & Touche 56
Digital 27
E
Eicon 17
EMI 25
Expersoft 31
F
FlexiInternational 31
Fore 30
H
Haystack Labs 37
HP 15,33
I
IBM 1,8,17,30,32,53,68,69
Information Builders 8
Intel 27,33
L
Lotus 1,6,33,68
M
Madge 13
Martin Information Services 56
Maximized Software 37
MCI 13,25,33
MegaSoft Online 37
MFS Communications 13,25
Microsoft 1,6,17,27,29,33,48
MobileWare 8
Motorola 8
N
NEC 27
NeoVista 31
NET 15
Netscape 17,29,32,33
NetStar 17
New Century 15
Novell 1,6,29,32,33
P
Packard Bell 27
R
ReCor 56
Red Brick 31
S
Stratus 13
Sun 29,37
Symantec 6
T
TCG 13
Tibco 31
U
Unison 27
X
Xerox 70
Z
ZeitNet 27

ADVERTISER INDEX

Advertiser	Reader Service#	Page#
3COM Corp	62	42-43
Acsend Communications		14,15
Ascom Timeplex	43	19
Bay Networks	44	72
Cascade Communications	45	24
Cisco Systems		34-35
CNT Brixton Systems	46	32
Compact Devices	60	30
Compaq Computer Corp		10-11
DCI/NWW-Unplugged		52
Digi International	59	49
Digital Equipment Corp	61	20-21
Dynatech	53	50
Fore Systems	51	16
Hewlett-Packard		7
IBM		26,38-39
Kingston Technology	58	46
Microsoft Corp		2-3,36,40
Newbridge Networks	47	71
NORTEL	48	4
Novell Inc		17
PairGain Technology	57	9
Siemens Rolm Systems	56	28-29
SNET	49	22
Standard Microsystems Corp	55	23
Swiss Telecom	50	51
US West		33
Verilink Corp	54	18
Visual Networks	52	12

Intranet Magazine	Reader Service#	Page#
ACC	26	34
ANS Core Systems Inc	27	11
Apertus Technologies	28	23
Border Network Technology	29	12
Cabletron Systems Inc	30	13
ChatCom	31	37
CheckPoint Software	32	16-17
Compaq Computer Corp		21
Digital Equipment Corp		26-27
Global Internet	33	18
IBM	42	25,51
ICON Corp	34	9
IDG/ICE		39
Microsoft Corp		2-3
NetManage	35	30-31
NetScape	36	52
Network 1	37	6
NORTEL	38	14
Novell		19
PC Expo		42
Stratacom Inc	39	4
US Robotics	40	44-45
UUNET	41	29

Marketplace Advertiser Index	Reader Service#	Page#
ADIC	246	58
Allen Systems Group	229	62
Castle Rock Computing	252	58
Cybex Computer Products Corp	227	62
MaxNET	267	60
NetSuite		58
Rave Computer Association	302	60
Secure Computing	305	59
Technically Elite	247	60
TODD Enterprises Inc	266	62
Vive Synergies	261	62
West Hills LAN Systems	297,253	61,63

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Feds taken to task over U.S. encryption export policy

Privacy advocates say U.S. ban helps foreign companies.

By Ellen Messmer

At a forum on U.S. encryption policy sponsored by the Electronic Privacy and Information Center (EPIC) last week, industry and privacy advocates once again bashed the U.S. government, this time claiming the U.S. ban on strong encryption harms American industry but helps foreign competitors.



RSA's *Bidzos speaks out against encryption policy.*

U.S. companies cannot export strong encryption without special licenses, but competitors can freely import their cryptography here.

Roundly condemning this policy, Jim Bidzos, president of RSA Data Security, Inc., told attendees at the forum that Nippon Telegraph and Telephone Corp. (NTT) has produced a chipset that uses 1,024-bit encryption with RSA's public-key exchange method to scramble data, and is selling the chipsets in the U.S. and other countries.

A 1,024-bit key length is believed to be unbreakable.

"If there's anyone in the government who hasn't already seen the writing on the wall, here it is," said Bidzos, who for years has sparred with the National Security Agency and White House officials over export rules and the government's key-escrow initiative.

Critics at the EPIC forum also complained that the Clinton Administration is wrong to push its key-escrow policy at the Organization for Economic Cooperation and Development, where the group of 35 industrial countries is trying to agree on a common approach to encryption by year-end.

The U.S. is split on encryption policy, with many in Congress ready to lift the export ban on encryption and prohibit mandatory key escrow.

Scott Charney, chief of the Justice Department's electronic crimes unit and the U.S. representative to the OECD, defended the key-escrow policy, saying, "The president had done a lot overseas without Congressional approval."■

Basic

Continued from page 6

application to continually update a spreadsheet or chart in a document.

Applications will also be able to communicate over the network later this year when Windows 95 and NT begin supporting distributed objects.

The move by Microsoft is welcome news.

However, its refusal to license VBA these past few years has forced companies such as Lotus Development Corp. to create their own scripting languages, in this case, LotusScript. In fact, at one point, Lotus considered licensing LotusScript free to counter VBA.

"This is the second time Lotus fell for the Microsoft sucker punch," said Don DePalma, senior analyst with Forrester Research, Inc. in Cambridge, Mass., pointing out that Lotus put its weight behind OS/2, which Microsoft originally supported, and found itself late to the Windows market.

Standing by VBA

A sampling of companies that plan to add Visual Basic for Applications to their software:

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SAP	SAP R/3

Others, such as WordPerfect (now owned by Corel Corp.) were also forced to develop alternative scripting strategies. And some 200 companies were forced to license Visual Basic clones.

Basic lead

Meanwhile, Microsoft, with a huge headstart, has been steadily working VBA into its Office applications and leveraging the base of three million Visual Basic programmers. VBA appeared first in Microsoft Excel in 1993.

Microsoft's claim is that the technology was just not ready in 1993 for anyone else to use.

"At that time, we couldn't have supported people doing it," said Jon Roskill, group product manager in Microsoft's Internet platform and tools division.■

Novell

Continued from page 1

make NDS a central point of reference for application and user information on both server platforms before the end of the year.

"NT needs good networking and that is what we already have in NDS and in our other networking services," Frankenberg said.

Although Frankenberg said some management ties will come by year-end, he declined to say when users could expect NDS to run natively on NT Server. "That will probably take us longer to develop because, as you can imagine, we are not exactly getting full cooperation from Microsoft," Frankenberg said.

"Users want this, but Novell has kept restraining itself because it didn't want to lend credibility to NT," said Tom Kucharvy, president of Summit Strategies, a Boston consultancy. "Now that Novell is being squeezed out of implementations, it has got to ensure that NDS becomes established on networks whether NetWare is there or not."

Michael Simpson, product-line manager for NetWare, said Novell is investigating several different ways to give administrators running both platforms easier management via NDS.

The first possibility is to provide an agent for the NT Server to synchronize information within the NT Server domains with information in NDS. This will let a user manage both servers using existing NetWare tools.

A second option is to integrate the two servers by providing hooks from NDS into replication controllers within the Microsoft domain service. That would support replication of file and user information among machines.

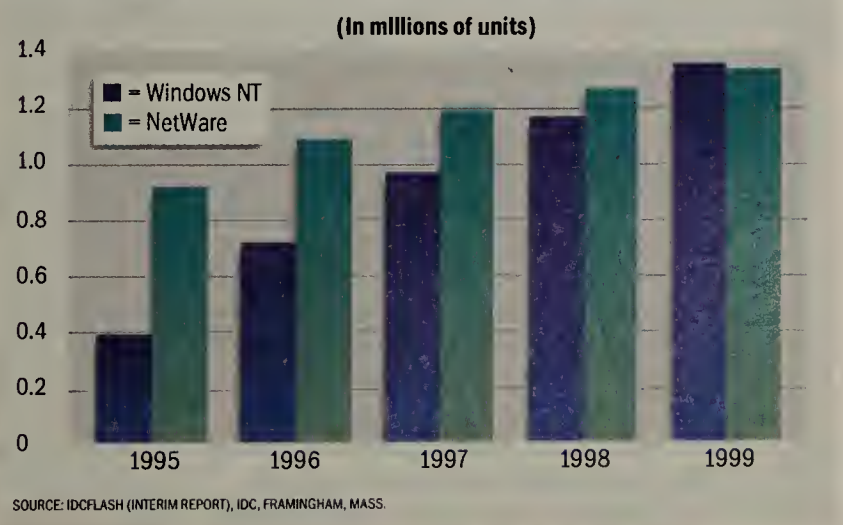
"Managing an NT network is a nightmare, and we won't get any relief from that until Cairo," said Gil Kirkpatrick, director of networking services at NetPro Computing, Inc., in Scottsdale, Ariz. Microsoft will not deliver a comprehensive directory service until Cairo, its redesign of NT expected to ship next year.

"The domain service in NT doesn't lend itself to rational administration, and NDS really does," Kirkpatrick said.

Novell's third option would be to develop a platform-independent version of NDS to run natively on NT Server. Novell's Simpson said NDS was designed to be portable, and Novell engineers are working to extract it from any dependencies on the network operating system.

If you can't beat NT. . .

Novell needs to accommodate NT servers in NetWare environments given that worldwide sales are expected to surpass those of NetWare by 1999.



SOURCE: IDCFLASH (INTERIM REPORT), IDC, FRAMINGHAM, MASS.

Looking for kudos

Users may be excited about better management of combined NetWare and NT LANs. But analysts say that for NDS to play a strong role in the marketplace, Novell must convince developers to write applications that take advantage of NDS in mixed networks.

"There are two sides of this directory equation. One side is the administration side, and Novell does have a stronger story there. The other is the applications that are written to support the directory. That is where Microsoft has a story," said Neil MacDonald, senior research analyst with Gartner Group, Inc. in Stamford, Conn.

Simpson said Novell is working to expose the NDS APIs in order to make it easier for application developers to write applications that support NDS across multiple platforms.

"When we put NDS on NT, it will allow the developer to write to one common directory infrastructure. It's quicker time-to-market for the developer," Simpson said.■

Madge

Continued from page 13

each provide a 4G bit/sec switching backplane and boast a throughput capacity of 5.8 million packet/sec.

But what sets them apart is sophisticated management, according to one customer. "More than anything, we need the ability to know where the highest performing ports on the network are and also be able to drill down to the MAC or IP address level to gauge how the network is running," said Michael Nitka, IT director at Network Telephone Services Corp. in Woodland Hills, Calif.

The Visage products support Madge's Remote Monitoring-compliant Switched Monitoring (SMON) network management application. SMON provides simultaneous monitoring of all switch ports, giving net managers key information such as traffic utilization, error rates and top-talkers.

While Madge's SMON software is a good start, Nitka said, he would like to see improvements to the application, such as the ability to exhibit cumulative statistical displays and collect statistics over shorter intervals.

Another differentiator of the Visage gear is price. Customers can buy Madge's new Ethernet switch configured with the SMON network management module and a high-speed uplink for about $190 per port. Competitors' Ethernet products range from $200 to $1,000 per port.

"When you are talking about Ethernet, price is extremely important," said Glenn Gabriel Ben-Yosef, president of Clear Thinking Research, a consultancy in Boston.

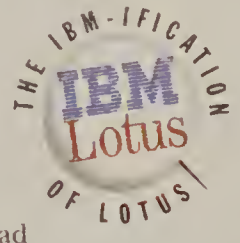
Madge was beaten to the Ethernet stackable switch party by the likes of 3Com Corp. and Cabletron Systems, Inc. But analysts said there is still plenty of opportunity. The Dell'Oro Group consultancy in Menlo Park, Calif., expects market revenue to double from $6 billion this year to about $12 billion in 1998.

& Madge: (800) 876-2343.

Anniversary

Continued from page 1

Cambridge, Mass., software maker, forcing Lotus officials to consider their options. Some advocated finding a white knight; others wanted to succumb to the powerful Big Blue knight, recognizing that IBM might be Lotus's only chance to stave off Microsoft Corp. in a number of markets. And then there was Lotus CEO Jim Manzi, who dug in and vowed to stay independent.



Of course, shareholders forced Manzi to finally give in. The Lotus chief stayed for just 99 tense days, working with IBM chief Gerstner, who Manzi had fought in an effort to keep IBM away, and with his own top executives, who had pushed Manzi to accept the IBM deal.

Others, including sales honcho Bob Weiler, also took the money and ran.

But then IBM stepped in, and organized the chaos by giving Lotus veterans Jeff Papows and Michael Zisman the reins and making it clear that Ray Ozzie, the father of Notes, would be staying on at least through the development of Notes 5. Then true to its hands-off promises, IBM stepped back, allowing Lotus to ship its much-anticipated Notes Release 4 on time and well ahead of competing products from Microsoft and Novell, Inc.

While much was made of the apparent culture clash between Lotus and IBM, many members of the Lotus community started to realize the companies might not be so different after all. Lotus wasn't the same freewheeling company it was in the early 1980s, and IBM was no longer just a bunch of stuffed shirts.

In fact, on their first visit to IBM's corporate headquarters in Armonk, N.Y., Lotus executives reportedly donned business suits and found the IBM brass dressed casually.

"People had this idea that the blue suits and white shirts would descend on Lotus, and that simply hasn't happened," said Steve Sayre, vice president of marketing at Lotus.

Time starting to tell

Now, a year after Lotus agreed to the takeover, most observers agree that things have worked out pretty well. Lotus is still Lotus, though it has a bit of a bluish tint to it.

"I don't see any evidence that IBM has hurt [Lotus]," said Scott Webster, electronic mail administrator at Canadian Occidental Petroleum, Ltd. in Calgary, Alberta, which has about 800 Notes seats.

But the question is: Has IBM helped?

After all, IBM has a lot to offer Lotus. When the deal was struck, there was much talk of integrating the Lotus messaging products and other applications with IBM's hardware as well as its management, database and middleware products.

Some of this has already happened. Their first codevelopment effort brought Notes users access to IBM's ImagePlus imaging repository files. In addition, Lotus' SmartSuite applications pack is now bundled with IBM PCs.

In the second half of the year, the companies will launch a campaign to migrate IBM's OfficeVision installed base to Notes, sources said. IBM is also beefing up the links between its MQSeries middleware and Notes to support the bidirectional movement of data.

Despite these efforts, many observers, and even Lotus insiders, feel that IBM has been too hands-off so far.

"They're talking about [taking advantage of each others' technology], but we haven't seen much yet," said David Marshak, an analyst at Patricia Seybold Group, Inc. in Boston.

For example, IBM has been relatively closemouthed about melding its workflow software with Notes, Marshak said. Similarly, IBM's strength in systems management has yet to rub off on Lotus.

IBM also could have done better this past year pushing Notes to its corporate customers and melding Notes into its overall software strategy, analysts said.

"When you buy Notes, it should feel like you're investing in a relationship, not just a product, and they could use IBM technologies to create that feeling," said Eric Brown, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Jeff Tarter, editor of the Watertown, Mass.-based industry newsletter "SoftLetter," said IBM's sales force could be doing more to push Notes.

"IBM's sales force is either not talking to Lotus customers or the changeover hasn't been handled very well. The IBM sales force isn't putting a lot of effort into the Lotus customer base. The good IBM salespeople are still rewarded for selling hardware," he said.

Others questioned whether IBM's hands-off strategy will work in the coming year as the company moves ahead on its plan to make Notes the front end to IBM's core back-end software systems.



"There are still only a core group of people who understand Notes. [IBM and Lotus] still have this division of expertise," according to Gary Rowe, an analyst in the Atlanta office of Rapport Communication, a market research and consulting firm.

With so many Lotus employees now gone and with IBM shouldering more of the Lotus burden, some users said they now feel out of touch. "Before [the acquisition], every time something happened, I knew about it. Now, I don't seem to have the access that I had before," said one Notes administrator who asked for anonymity.

One Notes reseller complained that it's hard to get IBM's attention unless you're selling more than 1,000 seats of Notes. "I deal with companies that buy 50 or 100 Notes seats, and IBM doesn't seem

WHERE HAS EVERYONE GONE?

A host of Lotus executives have fled since IBM came to town.



Jim Manzi
Former chief executive officer
Now at Industry.Net



John Landry
Former senior vice president and chief technology officer
Now at Narrative



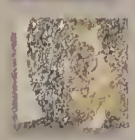
June Rokoff
Former senior vice president of worldwide sales and support
Now a consultant to Lotus



Bob Weiler
Former senior vice president of sales
Now at Wang



Jeffrey Beir
Former senior vice president of desktop business group
Now at Boston-based start-up



Edwin Gillis
Former chief financial officer
Now at Parametric Technologies

The IBM/Lotus report card

IBM has made its presence felt across several Lotus Development Corp. product lines since last year's acquisition.

Here's a rundown of the results:

■ cc:Mail — Under Lotus, cc:Mail was viewed as a legacy product, and the company focused on moving the installed base to Notes. But, reportedly, the migration from the file-sharing cc:Mail to Notes has been slower than expected.

IBM, on the other hand, still views cc:Mail as a strategic product and wants to keep the installed base happy. "IBM is more comfortable with the downsizing of PROFS [to Notes] than with the upsizing of cc:Mail [to Notes]," one observer said.

In April, Lotus shipped the long-awaited cc:Mail Version 6, which even exploits some IBM database technology that significantly eases administration of cc:Mail Post Offices. At the same time, Lotus outlined plans for cc:Mail Version 7, which will be able to access either cc:Mail Post Offices or Notes servers.

■ The Internet — Lotus has become increasingly aggressive about tying its messaging products to the 'Net, although that probably would have happened whether or not IBM was on the scene. "Lotus has gotten Internet religion," said one former employee.

HTTP Services for Lotus Notes, code-named Domino, entered beta testing last month and is expected to ship by September. The Notes/Web Server hybrid includes some IBM technology "and would not have come to market as quickly had Lotus remained independent," according to David Marshak, an analyst at Patricia Seybold Group in Boston.

IBM has been less than forthcoming, however, on how the Lotus Web tools will play with IBM's 'Net offerings.

■ Notes — Sales are booming thanks to price cuts made possible by IBM's deep pockets and its army of salespeople. There are even TV commercials for Notes thanks to a hefty marketing budget. IBM has opened doors for Notes in several of its top accounts, too.

Since the buyout, Lotus has brought a well-received Release 4 to market that leapfrogged its chief groupware competitors on the features front. Lotus has added links to IBM's MQ message-oriented middleware, and is expected to deliver ties to the IBM CICS transaction system soon. Notes is also becoming better equipped to meet enterprise network needs, with support for server clusters on the way.

Still unclear, though, is whether IBM has really convinced its corporate customers that Notes should be the client/server platform for their legacy information.

■ Application suites — Though IBM has started bundling Lotus SmartSuite with its PCs since the deal, the application suite business appears to be drying up. Not even IBM could have reversed that trend, industry observers said.

■ Pricing — Despite deep Notes pricing cuts, customers are still concerned about the overall cost of running and supporting groupware. The key here is lowering the cost of developing and deploying Notes applications. IBM has done little in this area for Lotus.

— Barb Cole

to have much time for me," the reseller said.

Corporate customers, although nostalgic for the old days when Manzi called them frequently, said the acquisition has been a positive move for Lotus. In fact, the impressive growth of Notes to 4.5 million seats last year, up from about 1.5 million in 1994, has given IS managers confidence that Notes is a platform with a future.

Neal David, director of marketing information systems at Waters Corp. in Milford, Mass., said Lotus "has made its [product delivery] dates and done some great advertising which has been a big help to Notes."

According to company officials, IBM will continue to let Lotus operate independently. "The autonomy that Lotus has enjoyed will continue during the next year because it will help Lotus maintain its creativity," said Harold Bailey, vice president in charge of Lotus marketing integration.

"It's still Lotus," said Eileen Rudden, senior vice president of communications products at Lotus. "We just have a different owner," she said. ■

IBM gets Notes WAN service off the ground

After well over a year of piloting it, the IBM Global Network (IGN) finally launched its public Lotus Notes network service last week at the Comdex/Spring '96 show in Chicago.

InterConnect for Lotus Notes is available in all 100 countries where the IGN has a presence, company officials said. No interconnections with Notes service providers in other countries are a reality yet, although a worldwide consortium of providers is working toward that end.

IGN's service is based on the older Notes Release 3. In the third quarter, the company will announce a Notes 4.X-based version, said Jean Proulx, IGN's vice president for service integration and delivery. The initial offering is based on the older software "so we can help users now on Release 3 migrate to 4.X," she said.

The Release 4-based service will have Internet-oriented capabilities, such as Lotus InterNotes, which allows customers to extend their premises-based Notes content to the World-Wide Web.

Eric Paulak, an analyst at Gartner Group, Inc., a consulting firm in Stamford, Conn., said that aside from its renowned service and support, IBM is trying to distinguish itself with simple pricing. InterConnect for Notes carries a onetime $6,000 installation fee per enterprise, with a $2,500 monthly minimum usage charge. Users can satisfy the minimum through IBM's required $29 flat monthly fee per end point in combinatin with its $14-per-hour service usage charge.

—Joanie Wexler

Microsoft

continued from page 1

announced (*NW*, Oct. 9, 1995, page 1). The advent of Microsoft's SNA Server 3.0 could also put a crimp in the plans of other SNA gateway players such as Attachmate Corp., analysts said.

In efforts to secure a key role for Windows NT in enterprise networks, Microsoft has targeted IBM's lucrative mainframe and Application System/400 mid-range market with its BackOffice products, including SNA Server. SNA Server connects workstations to mainframes or AS/400s over TCP/IP, IPX/SPX, Banyan VINES and AppleTalk nets.

SNA Server has also had some success, with sales shooting up some 300% in the past year, according to International Data Corp. in Framingham, Mass. But the package still has a ways to go before catching up with the market leaders. It has 6% of the SNA gateway market share, compared to NetWare for SAA's 25%.

"Microsoft is going after the larger users with this release by addressing scalability and SNA application integration issues that have come up with other releases," said Don Czubeck, president of the Gen2 Ventures consultancy in Saratoga, Calif. "Users aren't at all sure what's going on with any of the Novell products right now and the slow-developing relationship with IBM on the development of the gateway gives them an even more uneasy feeling."

The features in the 3.0 package that are likely to garner the most attention — particularly among customers with big networks — are a boost in the number of users and sessions supported, plus the addition of native tn5250 TCP/IP links to AS/400 hosts.

Session and user support in 3.0 will be increased to 15,000 and 5,000, respectively, from 10,000 and 2,000 in the current 2.11 release. That could enable customers to support the same number of end users or more, with fewer servers. For example, users would need five NetWare for SAA gateways compared with two SNA Servers for a 10,000-user network.

Integrated tn5250 support will let any PC running a tn5250 emulator connect to the AS/400 without requiring TCP/IP on the mid-range box. The gateway, rather than the AS/400, takes care of the protocol conversion, thus saving up to 18% of the AS/400's CPU power, Microsoft said.

"We wanted TCP/IP support integrated into SNA Server because it would perform better and be easier to implement," said Mike Truman, internal consultant with the Oregon Department of Corrections in Salem. "We're hoping the new release will allow us to more efficiently support more remote users."

"Microsoft needed to do something with the TCP/IP support for the AS/400 because it's just been a bear to set up," added Todd Anderson, MIS director at J. Rubin & Co., a steel distributor in Rockford, Ill. "IBM's been of little help, too. If you're a small shop, you will need help setting this thing up."

Other improvements include support for the mid-range box's Shared Folders feature, which makes AS/400 files appear as though they are on a Windows NT Server drive. Additionally, Unix and Apple Computer, Inc. Macintosh workstations can now for the first time connect to the AS/400 through SNA Server.

Also included in this release is SNA Explorer, a graphical tool that lets users configure and manage large numbers of SNA Servers from a central console. Until now, there was no central graphical monitor for SNA Server. A new feature will let users encrypt data — using the Data Encryption Standard — between servers or clients in an enterprise.

SNA Server 3.0 also includes a single sign-on security package built by Proginet Corp. (*NW*, May 27, page 6). SecurePass provides two-way password synchronization between Windows NT Server and IBM mainframe or AS/400 boxes.

Improved support for IBM's Advanced Program-to-Program Communications technology will let users more easily integrate Windows applications and mainframe-based programs such as DB2.

SNA Server 3.0 should be available in October. Pricing will be announced then. ■

Comparing IBM and Microsoft gateway products

Vendor/Product	Maximum no. of host sessions	Maximum no. of users	PC hardware supported	Licensing
Microsoft SNA Server 3.0	15,000 (with any host)	5,000	Intel, Alpha, PowerPC, MIPS	Can be licensed in any number of user configurations
IBM NetWare for SAA 2.0	2,000 (System/390), 1,500 (AS/400)	2,000	Intel	Must be licensed in 16-, 64- or 128-user packs

International networks

Privacy policy debated by FTC panel

By Ellen Messmer
Washington, D.C.

A directive requiring European nations to craft new data privacy laws will have a big effect on how U.S. companies collect and transmit data abroad, experts told the Federal Trade Commission last week.

Joel Reidenberg, associate professor at Fordham School of Law, said the European Union's Privacy Directive not only forbids collecting data on a person's race, religion, health or sexual preference, it makes it illegal to transmit any personal data to a location without adequate privacy protection. That puts the U.S., where the marketing of personal information is almost a fine art, on a collision course with the new European privacy laws.

The European directive, which takes effect this fall, will, for example, make it far more difficult to collect and market data about Web surfers or online purchasers in Europe compared to the U.S., Reidenberg said.

The FTC, which held the two-day policy forum to air a variety of privacy issues, was told by Roger Cochetti, program director for policy and business planning at IBM's Internet division, that the directive will change what users in Europe can legally transport over their private networks, and perhaps the Internet, too.

The EU's Data Commissioners Working Party is looking at imposing new rules for data privacy on the Internet, added Mari Ann Blatch, consumer and government affairs consultant at The Reader's Digest Association, Inc., which, along with IBM and American Express Co., has held discussions with European officials.

The FTC panel debated the wisdom of setting up a U.S. data protection agency to parallel European efforts. Panelist Barbara Wellbery, chief counsel at the Department of Commerce's National Telecommunications and Information Administration, said NTIA, with the State Department, had pulled together an interagency team to work with European governments on the issue. ■

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The almighty ROI (which seems to be talked about more than practiced)

By the time you read this, I shall be preparing for a trip to Irvine, Calif., to deliver my Network World Intranets seminar. (Shameless plug: call (800) 643-4668 for information on this and the rest of the seminar series.)

One topic that has been brought up by seminar attendees is the question of return on investment. Indeed, much of what you read in the press concerning the way organizations are approaching intranets focuses on the lack of ROI justification.

One of the studies I discuss in my seminar concerns Silicon Graphics, which has a major intranet. (In defense of using a computer vendor as an example — some people think this is cheating as these companies are, by default, highly computer-literate and, therefore, less constrained in their experimentation — let me point out that what vendors do today is often the basis for what users implement tomorrow.)


Mark Gibbs

With dozens of servers in operation, Silicon Graphics' intranet, called Silicon Junction, has become a focal point of the company's IT thinking.

As for ROI, the IS folks note that because their intranet was built on an existing network infrastructure, and the additional software and hardware were trivial expenses, the system effectively has an incredible return.

But for all the interest in the ROI of intranets and the difficulty of assessing what the return really might be, one major issue is being overlooked: In general, U.S. information technology groups don't do ROI!

Over the past three years, I must have talked to close to 2,000 IT managers, and no more than 1 in 50 has performed a formal ROI evaluation of a project.

My guess is that we don't do ROI for two reasons. The first, and most compelling, reason is — to recycle an old joke — when you're waist deep in alligators, it is hard to remember that your objective was to drain the swamp.

But the second reason — and in many ways a far more profound reason for avoiding ROI models — is that when it comes to the majority of IT products and architectures, we really don't know what they will do in practice.

In IT, with the exception of major and very well-defined projects, ROI is probably not a tangible or practical issue.

When I say "do," I don't mean functionally, as in, will the project calculate the payroll? I mean, will the project's costs be measurable?

For example, many of you are rolling out Windows 95. Though you know the cost per desk of the upgrade, have you tracked the user costs of learning (which takes time away from real production), problem solving and all the other essentially hidden costs of getting everything shaken down and smoothed out? (To digress for a moment, while I much prefer Windows 95, the system does rather look like a load of bugs holding hands — apparently some 2,000 of them to date!)

To log the ROI details is more labor than we're usually willing to expend, and the best information such an analysis could provide would be that we had spent more than we planned.

Worse still, the lessons learned from something like a Windows 95 rollout will unlikely be applicable to Windows 98, or whatever the next major release will be called.

So let's not kid ourselves: In IT, with the exception of major and very well-defined projects, ROI is probably not a tangible or practical issue. The alternative? To just keep on doing as we have done, relying on our expert judgment. That is assuming that the alligators can be subdued long enough to let us think.

Have you done ROI on your projects? Are you fighting off the alligators? Send your learned opinion to mgibbs at@gibbs.com or leave v-mail on (800) 622-1008, Ext. 504. Look out behind you!

Xerox may have something with new document vision

I received E-mail complaining about my recent portrayal of Bob Dole as a politician who might say things just to get a vote. "How dare you," readers said.

It's not that politicians are dishonest, per se. They all tell self-serving stories. We vote for those whose stories seem right for us.

Network and IS managers face a similar challenge of evaluating vendor product stories. It's often a big game; you usually have to sort through the bull to identify the real potential benefits.


Dave Buerger

Xerox Corp. is a good example of a company weaving a new story in an effort to reinvent its public image. The $19 billion company was so successful selling copiers that it lost control of its own brand name. Executives decided Xerox's position as a copier company was not a good long-term play. So it went for higher ground.

Two years ago, Xerox became "The Document Company." Its moniker is hard to miss. This message appears on everything from collateral to letterhead, from business cards to its home page, in huge type above the company name.

Xerox expects people will print to communicate, then discard the paper and reprint if needed. Most permanent data storage will be in digital format.

The Document Company's vision is, naturally, that documents tie everything together.

Xerox recently decided to aim this message at network and IS managers. The company is quick to remind us that despite all the networked offices, the business world's lifeblood — documents — are still tucked away in file cabinets. As The Document Company, Xerox is selling products that turn documents into digital assets.

You might wonder how Xerox defines a document. Its description actually is quite loose: "Information structured for human understanding." That's a big jump from "a stack of papers stapled together."

Xerox, incidently, is now portraying paper as a just-in-time communications system. Xerox expects people will print to communicate, then discard the paper and reprint if needed. Most permanent data storage will be in digital format.

The company wants to be a strategic leader, helping network and IS managers integrate the document cycle of creation, management and distribution. It sees documents as information containers and wants to help people glean value from content, not merely reproduce containers.

To that end, about half of Xerox's engineers now work on software, not hardware. The company now also sells consulting and integration services. Nevertheless, most revenue will still come from copiers. So what's really new?

The answer is a new role for copiers in corporate information systems. Xerox says today's copier is akin to a dumb terminal. In five years, software will transform copiers into PC equivalents — an intelligent digital platform that delivers value from content.

Examples of such value include document translation from one language to another. Another service will create instant short summaries from large reports, sort of a custom Cliff Notes for business.

Technical and marketing challenges block Xerox's goal. But the company also faces a bigger rival, which could undermine its whole strategy — namely, the use of intranets and the Web. The secret of the Web's stunning success is simple access to page-based electronic documents.

Xerox does not have clear answers relating its proprietary technology to the Web. It needs those answers fast if it wants to be a significant player. Otherwise, its fate will be similar to the PBX industry, which has struggled for years to be relevant to data networking.

On one level, Xerox's story seems geared to sell more networked copiers. But it also contains the germ of an idea that could bring major new value from networking. Let's hope the company that invented Ethernet and graphical computing can deliver another worthy vote-getter.

Buerger is a network industry consultant and writer in Atlanta. He can be reached at dave@buerger.com.

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REMOTE ACCESS	#1

Source: Recently published reports from Dataquest, IDC, and/or Dell'Oro Group.

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Cabletron Systems is a leading developer, manufacturer and marketer of standards-based Ethernet, Token Ring, FDDI and ATM networking solutions. Adhering to a strategic framework known as "Synthesis", Cabletron's product line provides the building blocks necessary to implement and manage a globally distributed platform of interconnected local and wide area networks. With Synthesis, customers are assured of a smooth migration from today's connectionless, router-based networks to the connection-oriented, switched virtual networks of tomorrow.

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Ganymede Software Inc.

Ganymede Software Inc. was founded in April 1995 and is headquartered in Research Triangle Park, N.C. Ganymede develops tools to test and monitor network performance. Each year, companies dedicate a large percentage of their information technology budgets to building data communication networks. Ganymede's products assist in making the diverse components of those networks work together in the most effective manner.

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Lucent Technologies

Lucent Technologies, formerly the communications systems and technology units of AT&T, makes the things that make communications work. The company produces communications systems and software for public and private networks; consumer and business telephone systems; microelectronics components; and services to support customer networks. Research and development is performed by Bell Laboratories.

MCI

MCI's exhibit showcases products and services captured under the networkMCIsm vision to create and develop advanced communications services which embrace the emerging opportunities of the information superhighway. Applications, innovations and network management solutions to meet evolving customer needs will be emphasized within the wide array of MCI's products and services featured.

Novell

ManageWise™ is Novell's complete management solution. ManageWise effectively manages your network's core components, including desktops, servers and network infrastructure. Novell is the world's leading networking software provider. Novell software provides the infrastructure for a networked world, enabling our customers to connect with other people and the information they need, any time and any place. Novell partners with other technology and market leaders to help customers make networks a part of their everyday lives.

Objective Systems Integrators

Objective Systems Integrators (OSI) develops and deploys communications-based operations supports systems products and services including network management, trouble management, service management (including service activation and provisioning), and data collection.

XYLAN Corporation

Headquartered in Calabasas, California, Xylan Corporation is a leader in LAN switching technology. Its products connect Ethernet, token ring, FDDI, CDDI, 100BaseT, and ATM, at wire-speed, with full translation. Low cost is coupled with powerful software features, including: AutoTracker™ virtual LANs; ATM PVCs, SVCs, and LAN Emulation; IP and IPX routing; and graphical network management on a broad set of platforms. Xylan's OmniSwitch product line includes a broad range of platforms, all of which use the same hardware technologies and run the same code. Extensive redundancy and reliability features are integrated into the products.

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Source: Recently published reports from Dataquest, IDC, and/or Dell'Dro Group.

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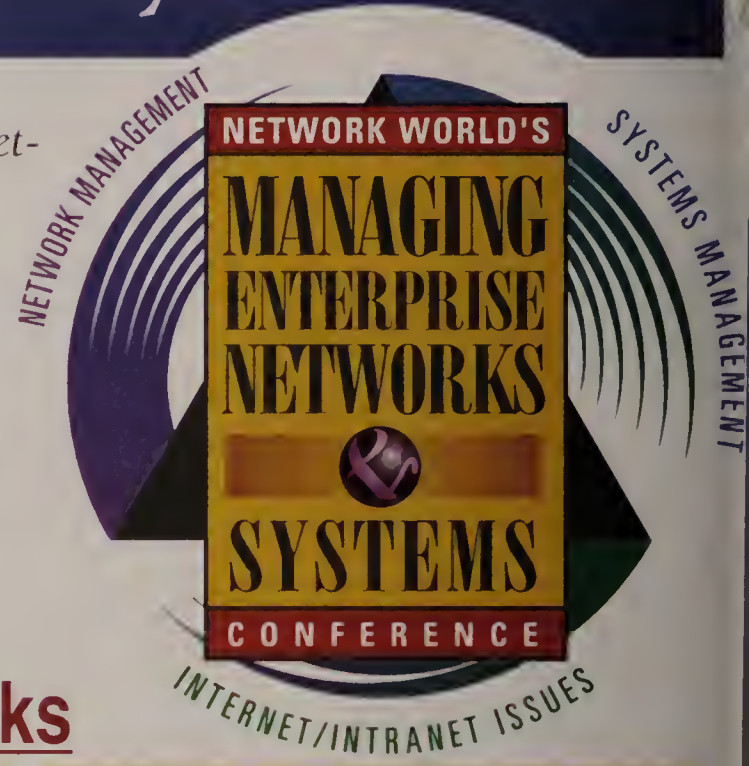
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